PROCEEDING

Improving Quality of Life Through Multi Sector Collaboration

4th UPHEC
UNIVERSITAS AHMAD DAHLAN INTERNATIONAL CONFERENCE ON PUBLIC HEALTH

Yogyakarta, February, 21-22, 2018

ISBN
ISBN 978-979-3812-74-4
9 789793 812946

PROCEEDING

Universitas Ahmad Dahlan International Conference on Public Health
(UPHEC)

"Improving Quality of Life Through Multi Sector Collaboration"

ROYAL AMBARUKMO HOTEL- YOGYAKARTA, INDONESIA

February, 21-22, 2018

Published by :
UAD Press

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"Improving Quality of Life through Multi Sector Collaboration"

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Proceeding

UPHEC

UAD International Conference on Public Health 2018

UAD International Conference on Public Health (UPHEC) is an international conference with proceeding, organized by Public Health Faculty of Universitas Ahmad Dahlan. Proceeding is an interdisciplinary abstract or full paper that publishes material on all aspect of public health science that covers (but not limited) to health promotion, occupational health and safety, epidemiolgy, health economic, psychology, pharmacy, health reproduction, maternal and child health. The proceeding and full paper is published on July, 2018.

Published by :
UAD Press

PROCEEDING

Universitas Ahmad Dahlan International Conference on Public Health

Theme:
"Improving Quality of Life through Multi Sector Collaboration"

Keynote Speaker
dr. Anung Sugihantono, M.Kes
(Directorate General of Public Health, Ministry of Health Republic of Indonesia)

Speaker I
Assoc. Prof. Dr. Yeo Kee Jiar
(Universiti Teknologi Malaysia, Malaysia)

Speaker II
Lina Handayani, Ph.D
(Universitas Ahmad Dahlan, Indonesia)

Speaker III
Dr. S.M. Raysul Haque
(Independent University, Bangladesh)

Speaker IV
Elli Nur Hayati, Ph.D
(Universitas Ahmad Dahlan, Indonesia)

Speaker V
MA. Teresa G. De Guzman, Ph.D
(University of the Philippines, Philippines)

February 21-22, 2018
Yogyakarta, Indonesia

Organized by:
Faculty of Public Health, Universitas Ahmad Dahlan
Faculty of Psycology, Universitas Ahmad dahlan

Foreword from Rector of Universitas Ahmad Dahlan

Good morning, Greeting to all of us

1. The honorable Keynote Speaker : dr. Anung Sugihartono, M.Kes (Directorate General of Public Health, Ministry of Health Republic of Indonesia)
2. Prof. Dr. Yeo KeeJiar (UTM, Malaysia)
3. Ma. Teresa G. De Guzman, Ph.D (UP Manila, Philippines)
4. Dr. S.M. Rasyul Haque, School of Public Health Independent University Bangladesh
5. Novi Chandra, Ph.D , Universitas Gajah Mada
6. Speaker from UAD : Lina Handayani, Ph.D and Elli Nurhayati, Ph.D
7. And, the excellences the invited guests, presenters, and the participants

Assalamu'alaikumWr.Wb

Welcome to the Universitas Ahmad Dahlan and the 4rd International Conference on Public Health (UPHEC).This event is held annually by the Faculty of Public Health Universitas Ahmad Dahlan with different collaborators. The principal purpose of this conference is to disseminate the scientific research in the Public Health domain, included the Quality of live through multisectoral collaboration.

Quality of life index is an estimation of overall quality of life which takes into account purchasing power index (higher is better), pollution index (lower is better), house price to income ratio (lower is better), cost of living index (lower is better), safety index (higher is better), health care index (higher is better), traffic commute time index (lower is better) and climate index (higher is better). In the year 2017 Indonesia occupies the 45th position out of 56 countries. This position an improvement after the previous year in 2016 Indonesia ranked 57th (from 61 countries). Despite the increase, Indonesia is still under neighboring countries such as Singapore, India and Malaysia.

It is obvious that the effort to improve the quality of life can not be solved only by the health sector alone. Multi-sectoral colaboration is required to achieve equitable development in various sectors in improving quality of life. It is important for us in Indonesia especially in Yogyakarta to have a program to learn the experience of multisectoral collaboration to improve quality of life from other countries. Therefore, in this 57th*MILAD* UAD series, we will hold an international seminar with the theme "Improving Quality of Life through Multisectoral Collaboration" which invite speakers from UAD and abroad.

This conference has become an effort in enhancing the knowledge of researchers, policy maker, studenst, other stakeholder and all participants. Hope this conference as a media for scientific gathering and collaboration between the participants taking into account in improving quality of life through multisectoral collaboration. Finally, and once again, welcome to UPHEC and with "Bismillahirohmanirohim" this conference officially opened.
Thank you for your attention.

Wassalamu'alaikum Wr.Wb.

Yogyakarta, February 2018
Rector of Universitas Ahamd dahlan

Dr. Kasiyarno, M.Hum.

Welcome Address from

Chairperson of the Universitas Ahmad Dahlan International Conference on Public Health (UPHEC) 2018

Assalamu'alaikum warahmatullahi wabarokatuh,

Thanks to Allah SWT, which has given us guidance and blessing, therefore we were able to complete book of abstract for the 4thUniversitas Ahmad Dahlan Public Health Conference (UPHEC). This conference is a series of UAD 57thanniversary activities. It is a collaboration between Faculty of Public Health and Faculty of Psychology, UAD. The theme of the 4thUPHEC "Improving Quality of Life through Multisectoral Collaboration" is deliberately appointed to support inter-sectoral collaboration to improve health status, especially to improve the quality of life.

This book of abstract is a collection of all abstractssubmitted to the 4th UPHEC. This book is compiled by scientific team guided by good abstract writing guidelines. We hope this book could be a media for all of us to share information; improving research quality, publication; and broadened our network.

Feedback from expert and everybody who have read this book are highly valuable. We would like to thanks to all who have worked hard and participated in completing this book. May this book bring benefits for all of us.

Wassalamu'alaikum warahmatullahi wabarokatuh.

Best Regards

dr. Nurul Qomariyah, M.Med.Ed
Chairperson of UPHEC 2018

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Schedule of Conference

Day	Time	Description	Venue
Wednesday, February 21, 2018	06.30-07.30	Registration	The Kasultanan Ballroom 3
		Setting Up the Posters	8th Floor
	07.30-08.50	Opening Ceremony	The Kasultanan Ballroom 3
		Safety Induction	
		Recitation of Holy Qur'an	
		Sing the National Anthem: Indonesia Raya	
		Melayu Dance	
		Speech: 1. Chairman of UPHEC : dr. Nurul Qomariyah, M.Med.Ed 2. Rector: Dr. Kasiyarno,M.Hum	
	08.50-09.35	**Keynote Speech: dr. Anung Sugihantono, M.Kes "The Role of Indonesian Government in Regulating Policies to Improve Quality of Life"**	
	09.35-09.45	Photo Session	
	09.45-10.00	Coffee Break	
	Plenary Session 1		
	10.00-10.30	1. Assoc.prof. Dr. Yeo Kee Jiar **"Effort of NGO in promoting comprehensive sexuality education to improve quality of life among local and refugee communities: an exploration of NGO perspective in Malaysia"** Moderator : Syamsu Hidayat, Ph.D	The Kasultanan Ballroom 3
	10.30-11.00	2. Lina Handayani, PhD **"Breastfeeding Promotion"** Moderator : Syamsu Hidayat, Ph.D	
	11.00-11.30	Discussion	
	11.30-12.30	Break Session	Voyage 2nd floor
	Plenary Session 2		
	12.30-13.00	1. Dr. S.M. Raysul Haque **"Feasibility of Using Subjective Health Measurement Tool for Assessing Population Health in Developing Country "** Moderator : Dr. AM. Diponegoro, S.Ag.,M.Ag	The Kasultanan Ballroom 3
	13.00-13.30	2. MA. Teresa G. De Guzman, Ph.D **"Integrating Indigenous Knowledge Systems and Practices (IKSP) in Health and Disaster Reduction"** Moderator : Dr. AM. Diponegoro, S.Ag.,M.Ag	
	13.30-14.00	3. Elli Nur Hayati, Ph.D **"Domestic Violence and Women's Quality of Life"** Moderator : Dr. AM.Diponegoro, S.Ag.,M.Ag	

	14.00-14.30	Discussion	
	Call for Paper		
	14.30-15.30	Call for paper group A (Session 1)	Pemandengan I Room
		Call for paper group B (Session 1)	Pemandengan II Room
		Call for paper group C (Session 1)	Pemandengan IIIIRoom
	15.30-16.00	Coffee Break and Ashar Prayer	8th floor
	16.00-17.00	Call for paper group A (Session 2)	Pemandengan I Room
		Call for paper group B (Session 2)	Pemandengan II Room
		Call for paper group C (Session 2)	Pemandengan III Room
Thursday, February 22 2018	**Workshop**		
	07.00-07.30	Registration	8th Floor
	08.00-09.00	Poster Presentation	8th Floor
	09.00-12.00	**Workshop 1 : Qualitative Research** Trainer: Dr. Yeo Kee Jiar Moderator : dr. Nurul Qomariyah, M.Med.Ed	Pemandengan I Room
		Workshop 2 : Role of the Indigenous Knowledge Systems and Practices (IKSP) in Health and Climate Change Adaptation Strategies Trainer: MA. Teresa G. de Guzman, Ph.D Moderator : Oktomi Wijaya, S.KM.,M.Sc	Pemandengan II Room
		Workshop 3 : Community Empowerment Trainer: Novi Chandra, Ph.D Moderator : Elli Nur Hayati, Ph.D	Pemandengan III Room
	12.00-12.30	Closing	(each room)
	12.30-13.30	Lunch	8th floor

The Parents Role to Educate the Kids in Digital Era

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Article Info

Keyword:

The Parents Role,
Educate The Kids,
Digital Era.

ABSTRACT

The kids in this era are a negative digital generation, they have recognized electronic media and digital world since they were born. Meanwhile the parents should be able to protect them from the threaten of digital world, but in other side they should be able to select any kinds of information from digital world and they can take benefit from that. The parents' role are needed to identify any kinds of programs or aplication which have education program and giving positive impact for the kids's growth. The parents should make monitoring and good comunication with the kids to make them more selected and wise in using internet. This research purposes to give some perspective toward the parents 'role in education in the midle of digital era. The method used in this research is qualitative and used relevan data to cultivate the data.

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1. INTRODUCTION

Data on the use of internet among children and adolescents in Indonesia was released on Tuesday in Jakarta.The study was supported by UNICEF as part of a multi-country project on the Digital Citizenship Safety program, and was conducted by the Ministry of Communications and Informatics on children and adolescents of up to 19 years old with a population of 43.5 million children and adolescents. Many children still use computers (69%) or laptops (34%) to access the internet. However, mobile phones and smartphones also play an increasingly important role (52 %), with children and adolescents being a key driver of this development. According to Roy Morgan's research, smartphone growth in Indonesia doubled between 2012 and 2013 to 24%. A total of nine out of ten children (89%) communicate online with friends, while a smaller portion also interact with their families (56%) or their teachers (35%) over the internet, with topics of the chat are mostly about with school activities. However, a significant group (24%) would also be in contact with people they do not know. Similar percentage (25%) is similar in numbers as well as addresses and phone numbers, which is overall about potential among young internet users in Indonesia. A particular concern is the relatively high percentage of children who are victims of cyberbullying. A total of 42% of respondents are bullied online, and 13% of them, translated into thousands of children, have been bullying victims for the previous three months (https://www.unicef.org/indonesia/id/media_22169.htm.

Gadgets in the globalization era are very easy to find, because most people have gadgets. Because gadgets are not only circulated among teens (aged 12-21) and adults or elderly (aged 60 and over), but also among children (aged 7-11). Ironically, gadgets are not unfamiliar to children aged 3-6 who are not supposed to use gadgets. This issue indeed cannot be separated from the introduction of world free market in 2008 in which Indonesia is included in the main targets of sales of electronic products, especially gadgets. Gadgets that are initially only be able to be purchased by someone who has a high income can now be afforded by someone with a mediocre income for a cheap price and with a regular payment system. In addition, nowadays many manufacturers of gadgets deliberately make children as a marketing target.

The tendency of excessive and inappropriate use of gadgets will make a person be indifferent to the environment, both in the family environment and society. A person's ignorance of the surrounding circumstances can make a person shunned and even alienated by the society. A child's behavior in using gadgets has both positive and negative effects. Positive impacts of the use of

gadgets are their ability to facilitate childrenin terms of creativity and intelligence. For example, the applications of coloring, learning to read, and writing letters certainly provide a positive impact on the child's brain development.

Children do not need more time and energy to learn to read and write in books or papers. Children will be more eager to learn because this kind of application is usually equipped with interesting images. In addition, the children skills will also be polished. However, the use of gadgets also has significant negative impacts for children. With the ease in accessing various media information and technology, a lot of children would become lazy to move and do any activities. They prefer to sit still in front of their gadgets and enjoy the world that is in the gadget. They have gradually forgotten the pleasure of playing with their peers, as well as with their family members. It certainly will adversely affect the health and development of growing children. (Wahyu,N. & Nurul, K., 2016)

Based on survey results of the Association of Internet Service Providers of Indonesia (APJII), the number of Internet users in Indonesia in 2012 has reached 63 million. It has reached 24.23% of the total population of Indonesia. The growing number of internet users continues to increase. In 2009, the number of Internet users in Indonesia amounted to 30 million, 2010 with as many as 42 million users, 2011 with 55 millionusers, and in 2012 with 63 million users. This figure is clearly a tremendous potential for marketing business. Weny Rochmawati quotes Anne and Glenn suggesting that the percentage of children accessing Internet (5-8 years) in Australia is as much as 20.6% for 5 year olds, 33.4% for 6 year olds, 42.2% for 7 year olds, and 52.6% for 8 year olds. From this data, it can be concluded that the number of children who access the internet keeps increasing. This trend is of course also true in Indonesia. (Masyaru, U., 2013)

Meanwhile, a survey study by Indonesian Child Protection Commission (Komnas Perlindungan Anak) in 2010 revealed that 97% of adolescents had ever seen or accessed pornographic material, 93% of teenagers had kissed, 62.7% of teenagers had sexual intercourse, and 21% of Indonesian adolescents had abortions. The data shows the ironic condition in Indonesia. Pornography is already widespread in Indonesia. Not only teenagers, buta lot of children also have access to it. Based on a survey by Yayasan Kita and Buah Hatiin 2005 in 1,705 elementary school children aged 9-12 in Jabodetabek. The results revealed that 80% of them had accessed pornographic material from various sources such as comic, VCD / DVD and porn sites. In Indonesia, porn comics can be obtained with onlyIDR 2,000 - 3,000, while the price of porn VCD is only about IDR 10,000 for two. Various pornographic media can be found in various places, ranging from the train station to the front of the police station. (Suyatno, 2011)

2. RESULTS AND ANALYSIS

The disclosures parents make online are sure to follow their children into adulthood. Indeed, social media and blogging have dramatically changed the development of children as they come of age. (Steinberg, 2017)Children's digital reference services are a form of interactive communication technology (ICT) used to support curriculum-based education. Accordingly, most research focuses on children's use of digital reference services for imposed queries within a setting of formal learning. In utter disregard for educators' and designers' desires, however, children frequently send unimposed queries to digital reference services to support their informal learning needs. In a discussion of bricks-and-mortar libraries, Riechel points out the importance of considering children's informal use of formal resources: "The completion of homework assignments is all too often perceived to be the only reason to visit the library" (1991, p. xii). He states that a reference service should serve as a "primary source for the fulfillment of all information needs, not just those that are school-related" (p. 120). This neglect is even more noticeable-and regrettable-in the study of digital libraries and their digital reference services, which are encountering growing numbers of self-initiated, unimposed queries from children.(Silverstein, 2005).Parents and educators tend to have many questions about young children and their computers and other technologies at home. They may find it difficult to know what is best for children because these modern toys and products were not around when they were young. Some will tell you that children have an affinity for technology that will be valuable in their future lives. Others think that children should not be playing with technology when they could be playing outside or reading a book. (Lydia & Joanna , 2013). We conclude the reasons why it is beneficial for education professionals to know more about children's experiences with technology at home: a.Childhood and technology should not mix. b. Young children are "digital natives". c. Technology hinderssocial interaction. d. Technology dominates children's lives. e. Play = learning. f. If it's interactive, it must be educational. g. Children need to get tech savvy for their future lives.

1. The things that need to be noticed by parents

1). Child's eye health: Excessive exposure to the use of a smart phone can trigger poor vision.2). Child sleep problems can occur because: The duration of viewing the digital screen, the impact of digital media content. 3) Concentration difficulties: The use of digital media has an effect on focusing skills in children, thereby increasing the hyperactive behavior and the difficulty to concentrate. 4). Decreasing learning achievement: Excessive use of digital media can decrease children's learning achievement. 5). Physical development: a. It limits the physical activity your body needs for optimal growth. b. Children often endure hunger, thirst, and have the urge to disrupt the digestive system while on their gadgets, causing an imbalance of body weight (too fat or too thin). 6). Social development: Growing up to be a more self-centered person so that it is hard to get along with other people, having trouble recognizing the different nuances of feelings. 7). Development of the brain and its relation to the use of digital media. 8). It is important for children to balance between playing on digital devices and playing in the real world. 9). Delayed child language development: Research has suggested that the use of digital media can disrupt a child's language development, especially for children aged 2 years and below.

2. The use of digital media according to age and stage of child development

Parents and children need to have an agreement on the use of digital media, not to protect children but to provide the right skills when children are exposed to information and media, because parents are unlikely to be able to supervise all the time.

Toddlers aged 1-3 years old

1). Having time limits on the exposure to digital media. 2). Utilizing digital media in audio form to add vocabulary, numbers, and songs. 3). Utilizing programs/ applications to improve pro social behavior to children, for example, empathy or sharing. 4). Utilizing information about different people with different backgrounds to learn about diversity. 5). Avoiding impressions of digital media programs that contain elements of violence and sexuality. 6). Avoiding scary digital media programming, such as ghosts. 7). Avoiding impressions of digital media programs that use language that is inappropriate and aggressive because the child can remember and imitate it. 8). Avoiding advertising services in digital media with inappropriate content for the child. 9). Accompany and interact with parents/ nursemaid when using media. 10). Avoiding using and digital devices as "substitutes" for parental companion.

Children aged 4-6 years old

1). Having mutually understandable and child-run agreements, monitoring the implementation, consistently applying the consequences of the offense and giving appreciation for the success of the child in carrying out the agreement. 2). Utilizing educational programs/ applications related to school readiness, such as the introduction of letters, numbers, and basic knowledge. 3). Utilizing a program/ application that teaches friendship behavior and appreciates the differences and diversity that exists. 4). Discussing the similarities and differences of children with favorite characters viewed through the media, with the aim of improving the skills of distinguishing the bad and the good. 5). Avoiding impressions of digital media programs that contain elements of violence and sexuality. 6). Avoiding digital media programs that can be introductions and gender deviations. 7). Avoiding digital media programs/ shows that show characters solving problems with violence. 8). Guiding children to know which are facts and which are fantasies.

Children aged 8-12 years old

1). Having understood and shared agreement, monitoring the implementation, consistently applying the consequences of the offense, and giving appreciation for the success in executing the agreement. 2). Utilizing programs or videos that show positive experiences that stimulate their imagination. 3) Discussing behavior of characters in the media that they know. 4) Discussing matters relating to the roles of men and women. 5). Avoiding impressions of digital media programs featuring aggressiveness, antisocial, and other negative behaviors. 6). Giving an understanding of jokes. 7). Avoiding excessive ad impressions, especially to recognize unhealthy diet and nutrition. 8). Avoiding displaying images or cigarette advertisements

Teens aged 12-18 years old

1). Having a understood and sharedagreement, monitoring the implementation, consistently implementing consequences of the offense, and giving appreciation for the success of the child in the implementation of the agreement. 2). Introducing diversity, race, ethnicity, and economic situation. 3). Inviting children to think critically of information services by asking questions like: "what do you think is the most interesting thing in this video?" 4). Utilizing impressions on media and digital devices to discuss different characters 5). Utilizing media blogs to train children to think critically and guide them to become writers, not just readers. 6). Inviting children to explore their interests and talents further. 7). Avoiding cigarette, liquor, and drug advertising. 8). Instilling positive social ethics in social media. 9). Pay attention to privacy settings in digital media, especially social media. 10). Limit the activities of children in social media.

Being (more) caring does not mean that parents should be good at and understand all the technical terms and devices of the device and digital media that their child buy or use. As long as the child is still dependent on the parents, the parents must know, not limit, what and how the device and digital media are used by the child. Parents should understand that the device and the digital media is a technology that is like a double-edged knife. If it is incorrectly used, it may harm the users. This requires extra responsibility from its users, or parents. It is a mistake for parents to allow the children to use the device and digital media however they want. The family's internal communication and parental role behaviors are the dominant and decisive factor for protecting children and families from digital devices and digital media exposure. (Sukiman, Maswita, & dkk, 2016).

A studyinvestigated whether the use of social media couldhelp support long-term participant retention in the NCS. The data suggest both broad and deep reach and influence of social media among the NCS Vanguard Study's target audience. For instance, 70% of Americans now use social media to connect with one another, engage with news content, and share information [1] and more than 80% of online Americans (and ~60% of all American adults) use the web to search for health information [2]. This increasing popularity of social media is having an important impact on health research. The use of different social media platforms (including Facebook and other interactive online programs) has been found to decrease attrition in longitudinal studies, encourage participants to engage in follow-up protocols, and generate active dialog in communities nationwide [3, 4]. In addition, social media can be used to reach very specific populations as its use transcends demographics [5]. However, while findings from this research suggest that social media offers new avenues for reaching and engaging research participants, implementation of these strategies can be fraught with challenges, key among which is security and confidentially of participant's personal information. Given this, the pilot study decided to evaluate social media as part of a larger outreach and engagement effort.Social media use has vastly increased in the last 10 years, with nearlytwo-thirds of American adults (65%) now using social networkingsites [6]. Much of this use is focused on health-related informationdissemination and engagement [6], as social media contribute to"facilitating, sharing, and obtaining health messages" [7]. In terms ofhealth information, 86% of women report that they make the decisionsabout healthcare treatments for their entire family [8]; and researchposits that health communicators should go where women spend time,which increasingly means online social network and blogging sites [9].(Amelia Burke-Garcia1*, 2017)

The use of the Internet by children at an increasingly early age today constitutes a major challenge for families and schools, aswell as affecting educational and social policy. This is a qualitative piece of research that analyzes parents' beliefs, everyday practicesand the difficulties they face in teaching their children the benefits and risks inherent in Internet use. The researchers used the discussion group technique, with four groups of parents of primary school children from four different schools. The resultsindicate that they share a pessimistic rather than an optimistic attitude towards Internet use among children in this age group, andperceive a number of difficulties when trying to foster children's responsible use of Internet. A wide range of parental control andmediation strategies were identified (laying down rules, organization of time and space for Internet use, limits and supervision(direct, agreed-upon, non-agreed-upon and technical), along with various support strategies (parent and sibling modeling, diverseteaching strategies for stimulation and family communication) which, with the exception of technical supervision, they often useto educate their children and control their behavior in other areas, and which form part of their general parenting style. The conclusionspoint to the need to develop digital competence among parents, and there is some justification for educational intervention, such as in promoting collaboration between families and schools.(Isabel Bartau, Ana Aierbe, & Eider Oregui-, Comunicar, n. 54, v. XXVI, 2018)

Another issue was the children's immaturity in dealingwith contents aimed at older children: "What worries me is that my nine-year-old daughter has hooked up with boysof 11 or 13, so she has access to the world that for her is fascinating, and now she wants a tablet to play online with some people, to play some war game. They want to have access to this older world which is still far beyond their understanding". Parents expressed concerns about the excessive amount of time spent online, and the inappropriateness of the time and place for doing so: "At Christmas, I was surprised to find that so many children sendeach other WhatsApp messages, often well after midnight".

Other parental concerns include the uncertainty generated by their children's use of Internet (17.59%) ("Rightnow, I don't know how they use it, now they are joining groups, and the more they join, the better it makes themfeel; it's not about how he uses it, but the stuff he is receiving"), the perception of their children being beyond theircontrol (14.76%), ("I believe the problem is this, you give them a cell phone, but with the Internet connection, yougive them freedom that you can no longer control… what they do is now beyond your control") and the risks theyperceive (16.65%), such as the invasion of privacy ("we are very worried about photos, the videos they record ofeach other, how they use them because they use Instagram, Twitter, Facebook, they use all of them; it is veryfashionable among girls of 13-14 to take topless selfies and pass them around the WhatsApp groups"). There is alsodependency ("I think they are addicted; at the weekends, they get up early and we have to tell them that they cannotuse their cell phones until 10am"), interpersonal conflicts ("The serious misunderstandings that occur onWhatsApp, you are not seeing the person's face; they don't realize, they think they are funny, they have beenworking on the issue of bullying, 'don't you call me that!'), or even criminal actions on the Net ("At school, itbegan with some photos, then there were more problems, yes, it's bullying, no it isn't bullying").(Isabel Bartau, Ana Aierbe, & Eider Oregui-, Comunicar, n. 54, v. XXVI, 2018)

Children use electronic screens at ever youngerages, but there is still little empirical research on howand whyparents mediate this media use. In line with Vygotsky's zoneof proximal development, we explored whether children'smedia skills and media activities, next to parents' attitudesabout media for children, and several child and parent-familycharacteristics, predicted parental mediation practices. Furthermore,we investigated children's use and ownership ofelectronic screens in the bedroomin relationship to the child'smedia skills. Data from an online survey among 896 Dutchparents with young children (0–7 years) showed that children'suse and ownership of TV, game consoles, computersand touchscreens, primarily depended on their media skillsand age, not on parent's attitudes about media for children.Only touchscreens were used more often by children, whenparents perceived media as helpful in providing moments ofrest for the child. In line with former studies, parents consistentlyapplied co-use, supervision, active mediation, restrictivemediation, and monitoring, depending on positiveand negative attitudes about media. The child's media skillsandmedia activities, however, had stronger relationshipswithparental mediation styles, whereas age was not related. Canonical discriminant analysis, finally, captured how thefive mediation strategies varied among infants, toddlers, preschoolers,and early childhood children, predominantly as aresult of children's media skills, and media activities, i.e. playing educational games and passive entertainment use.(Peter & Marjon, 2015).

Although many children turn into relatively competentusers of technologies already at a young age, parents orother caregivers are still facilitators, teachers, and gatekeepersof young children's media use. (Chiong, 2010). The importance of parents for children's mediapractices, which determines their media-induced learning,play, and social development, has been addressed in numerousstudies on parental guidance. These studies point toseveral types of guidance, largely described as 'parentalmediation', which Warren (2001, p. 212) defined as 'anystrategy parents use to control, supervise or interpret mediacontent for children'. In accordance with (Vygotsky, Thought and language, (1986), in thetheory on child development, parental mediation isseen as a key strategy in developing children's skills to useand interpret the media, foster positive outcomes and preventnegative effects of the media on children. Physical,emotional and social experiences, such as media use, andsocial interactions related to these activities with parentsand siblings, provide a scaffold for the child's development,especially when they occur within the child's zone ofproximal development. (Vygotsky, 1978)With regard toyoung children's media use, this means that when the childis engaged in specific media activities, the parent shouldapply a form of mediation that is developmentally appropriate. (Schofield, 2011).

3. CONCLUSION

With a good parenting pattern of parents, children will not be affected by the environment that sometimes gives a negative effect. Good quality education received by children that begins from the family will give birth to a generation of quality and character. Parents are demanded to intelligently supervise their children in using digital tools, especially in the meantime where the provision of education in school alone is not enough to equip them. Parents and family have an important role both within the

family, the environment, as well as school so that children are able gain useful knowledge for their future. Parents do not just give a gadget to make their children calm. Parents also need to participate and supervise what children do especially with the use of social media.

REFERENCES

Amelia Burke-Garcia1*, K. W. (2017). A review of social media methods and lessons learned from the National. Journal of Clinical and Translational Science, 1, pp. 260–264 doi:10.1017/cts.2017.19.

Chiong, C. &. (2010). Learning: Is there an app for that? Investigations of young children's usage and learning with mobile devices and apps. New York: The Joan Ganz Cooney.

Isabel Bartau, Ana Aierbe, & Eider Oregui-. (Comunicar, n. 54, v. XXVI, 2018). Parental mediation of the Internet use of Primary students: Beliefs, strategies and. Media Education Research Journal, ISSN: 1134-3478; e-ISSN: 1988-3293.

Lydia , P., & Joanna , M. R. (2013). Seven Myths About Young Children and Technology. *Chair in Education and Technology,*, 27-33.

Masyaru.U. (2013). Melindungi Anak dari Konten Negatif Internet. Khusus Anak. *Sawwa*, Volume 8, Nomor 2 April 2013.

Peter, N., & Marjon, S. (2015). How and Why Parents Guide the Media Use of Young Children. J Child Fam Stud, 24:3423–3435.

Schofield, C. (2011). Parental mediation theory for the digital age. Communication Theory, 21, 323–343.

Silverstein, J. (2005). ust Curious: Children's Use of Digital Reference for Unimposed Queries and Its Importance in Informal Education. *Library Trends*, Baltimore Vol. 54, Iss. 2, : 228-244.

Steinberg, S. (2017). SHARENTING: CHILDREN'S PRIVACY IN THE AGE OF SOCIAL MEDIA. *Emory Law Journa*, Atlanta Vol. 66, Iss. 4,): 839-884.

Sukiman, Maswita, D., & dkk. (2016). *Seri Pendidikan Orang Tua : Mendidik Anak di Era Digital .* jakarta : penerbit : kementrian pendidikan dan kebudayaan.

Suyatno, T. (2011). Pengaruh pornografi terhadap perilaku belajar siswa (studi kasus sekolah menengah. *jurnal pendidikan* , edisi I.

Vygotsky, L. S. (1978). Mind in society. Cambridge: Harvard

Vygotsky, L. S. ((1986). Thought and language. Cambridge: MIT Press.

Wahyu,N, & Nurul. K . (2016). Dampak Penggunaan Gadget Terhadap Tnteraksi Sosial Anak Usia 5-6 Tahun . *Jurnal PAUD Teratal* , Volumi 05 Nomor 03,182-186.

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The Effect of Posture Ulos Craftman Work on Occupational Health

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Article Info

Keyword:

Work Facilities
REBA
MSDs
Samosir Woven Fabric

ABSTRACT

In general weaving process using a loom in each region in Indonesia has a different name. One of them is on the island of Samosir called Gedogan. The loom is generally a hereditary looms used the craftsmen in Samosir that mostly used by women in producing Ulos. In the alications, the weavers must sit on the floor with legs stretched out in front accompanied by a movement bent to arrange the yarn and tools used repeatedly and continuously. Weaving activities commonly carried out for approximately 10 hours a day outside in the development of the breaks. This position often makes the weavers complained of pain in the muscles in the neck, arms, back, hips, buttocks, wrists, knees, thighs, ankle and foot. Therefore it is necessary to do modifications to the existing gedogan looms ergonomically. In the design of this ergonomic gedogan loom , analysis is carried out using Rapid Entire Body Assessment (REBA) as an indicator of improvement. The Aanthropometry was used in re-design of gedongan process. REBA scores before and after improvement was compared to assess the performance of the gedogan loom. The analysis results obtained that the improvement is carried out by changing the design of the gedogan from a sitting position on the floor to seat on a chair that has been adjusted to the craftsmen's body anthropometry. Parts such as tundaran, tagabe and tamapan also have been adjusted with height of the chair. There is also addition in sidurukan of a supporting part function on the seats that are useful as yarn tightening in woven fabric, sidurukan dimensions can be adjusted. The result of REBA analysis shows that there is a significant improvement between the condition before and after the use of the new tool. The results of the analysis of REBA score before improvement is 11 which fall in high risk and need immediate repair category. While the results of the assessment REBA score after repair is 4 with medium risk. This indicates that new design gedogan looms provides a smaller risk against Musculoskeletal Disorders (MSDs) than the initial looms.

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1. INTRODUCTION

Indonesia is a country rich in cultural heritage. One of them is the diversity of the woven fabric produced from traditional weaving. Some traditional woven fabrics include: woven Ulos of North Sumatra. Ulos woven fabric with a variety of shades and types of fabrics reflect the customs and culture of each region in Indonesia.

Ulos craft woven fabric made with a loom is made of planks and wood called *gedogan* looms. *Gedogan* loom isaweaverloom used by sitting on the floor. This tool is used in the weaving process of making the threads woven into the fabric by crossing two sets of threads by inserting the weft yarn transversely to the threads of the warp. Weavers are generally housewife women. Ulos woven fabric is made with various color combination with different types and patterns on each Ulos woven fabric. Ulos woven fabrics are typically used as a shawl at customary events. *Gedogan* loom can be seen in Figure 1:

Figure 1.*Gedogan*Weaving Tools

Based on observations, it was found that the musculoskeletal problems occurred were muscle fatigues in the neck, arms, back, hips, buttocks, wrists, knees, thighs, ankles and feet, asalsoindicated from the Standard Nordic Questionnaire (SNQ), as well as from direct interviews with weavers. The results showed the time needed in the process of weaving the Ulos woven fabrics and the repeated work being carried out.The assessment scores were obtained through Rapid Entire Body Assessment (REBA) and photos of weavers at work. Through Rapid Entire Body Assessment (REBA)methods, the obtained results of risk assessment scores of each weaver were analyzed.

Based on the results of the collected information obtained through direct interview, it was found that the weavers worked for ± 10 hours per day. The working duration of weavers increased the complaints of fatigue, requiring design improvement of the loom to reduce weavers' muscle fatigue while working. Standard Nordic Questionnaire (SNQ) was used to determine the body parts that experience pain in muscles. The measurement was conducted by using Rapid Entire Body Assessment (REBA) to determine the categories of risk (risk level) experienced by weavers on their activities during the weaving process.

Body dimensions were measured using the human body martin to obtain weavers' anthropometric data. Anthropometry is the size of each part of the body that is used as the dimension measurement for the new design of *gedogan* looms.

2. RESEARCH METHOD

The type of research is applied research. Applied research is one type of research that aims to provide solutions to certain problems practically. This research does not focus on developing an idea, theory, or idea, but rather focuses on the application of such research in everyday life.

The object involved in this research was the tool of loom and the subjects of observation were weavers.

The place of thewas one of the villages in Samosir, on the shore of Lake Toba, LumbanSuhi-Suhi village, Pangururan sub-district.

The instruments used in this study were SNQ Questionnaire, Human Body Martin and Meter. Meanwhile,the material used in this study was wood as the material for*Gedogan*.

Work procedures

The method used in this observation was based on the following:

a. Identification of the problems experienced by the weavers. In the process of problem identification, there were several stages:
   - Observation
   - Understanding of theory
   - Data collection and initial information
   - Formulation of the problem

b. Tools Designing
   This stage was the process of designing the tools needed by weavers and targetting dedication activities. This activity required preliminary data to be translated into the characteristics and specifications of the tools produced.

c. Toolmaking
   This stage was the process of creating the tool that had been designed for the device to function properly. The creation of standard operating procedures and a series of tests to evaluate the performance of the tool was an important part of this stage.

d. Tool Application
   This stage was the process of delivering the tools that had been created to the weavers. At this stage,the process would be simulated through the depictionofSolidWork software.

The working procedures to be carried out can be seen in Figure 2.

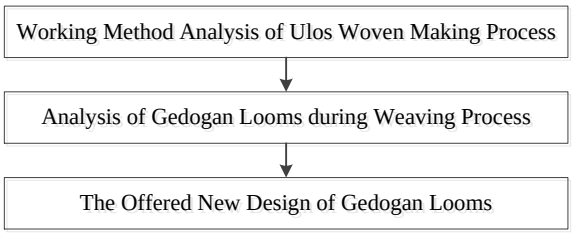


Figure 2. Working Procedure Offered For Problem Solving

Activity plan

The plan of activities to be carried out is shown in Table 1.

Table 1. Activity Planned

Activity Plan	Criteria	Indicators of Achievement	Benchmarks
I	Field studies	Surveying the weavers location	a. Analysis of the working methods used b. Analysis of the machinery and facilities used
II	Study	a. Working methods improvement b. Machine/ work facilities improvement	a. Identification of muscle complaints using SNQ and assessment with REBA b. Concept tool
III	Making tools	Ergonomics *Gedogan* Loom	Increased productivity

3. RESULTS AND ANALYSIS

In the actual condition, the position of the workers was sitting on the floor with their legs and backs bent for more than 60 degrees. If carried out continuously, it would cause pain in the back of workers. The workers' neck also lowered for more than 20^{o} and their shoulder rose while weaving. Such working position would be dangerous if done repeatedly.

REBA score on the initial *gedogan* looms indicated the need fora new tool design. The design of the new loomwas made with anthropometric approach. This design would also be made by considering thecratfsmen's body parts that experienced pain. These body parts were: the upper neck, arms, buttocks, elbows, wrists, and part of the foot, as well as sore muscle fatigue at the upper neck, shoulders, arms, thighs, knees, calves, ankles and feet.

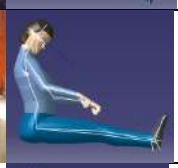
3.1. ANALYSIS OF REBA

The analysis of Rapid Entire Body Assessment (REBA) was performed on actual conditions in the village of LumbanSuhiSuhiToruan. The analysis was carried out on the limb as a whole. Each work element was examined. In this study, the focus was on the improvement of the working methods by using working posture assessment method of Rapid Entire Body Assessment (REBA) as shown in Table 2.

Table 2. Assessment Scores of REBA for Weaving Tools

Weaver	Actual Working Posture	Working Posture with CATIA	*Score* ofREBA
1			7
2			7
3			8

Table 2. Assessment scores of REBA for Weaving Tools (Continued)

Weaver	Actual Working Posture	Working Posture with CATIA	*Score* ofREBA
4			8
5			7
6			7
7			8
8			6
9			6
10			8
11			8
12			7
13			8

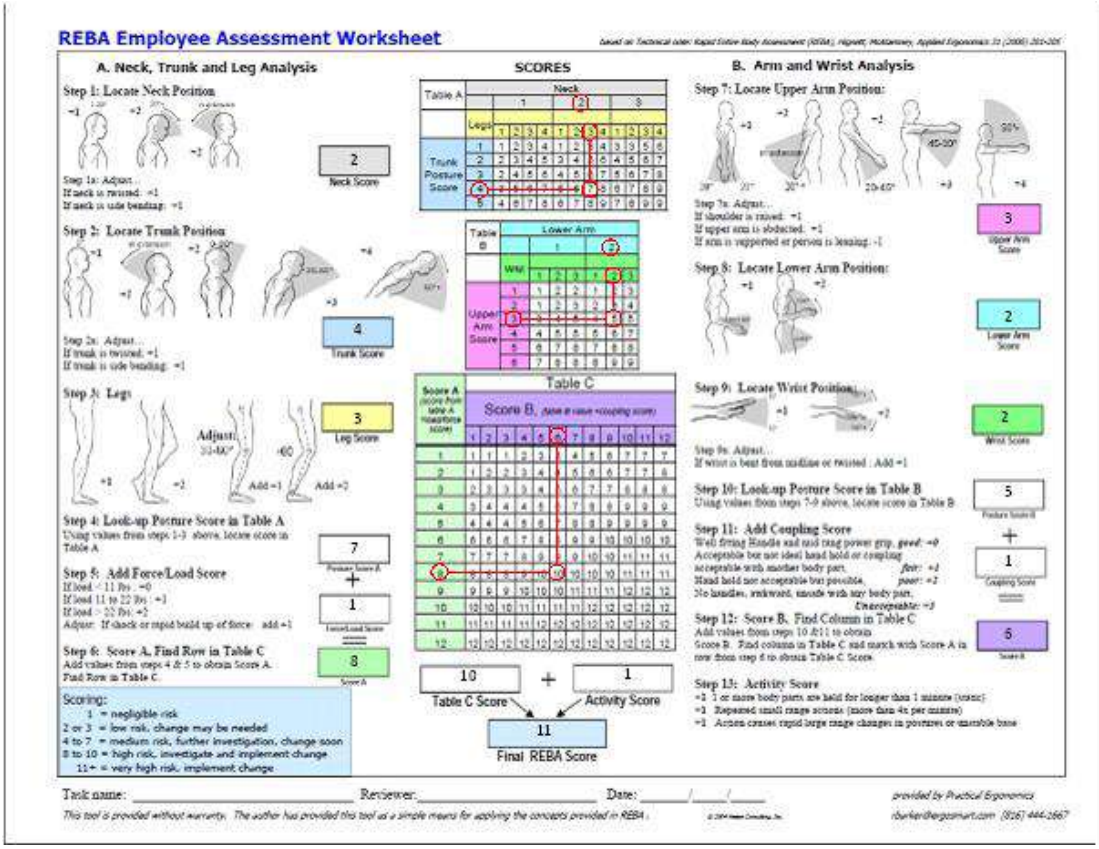


Figure 3. Assessment Score of REBA for Weavers at LumbanSuhiSuhi-ToruanVillage Information:

A. **Score A (neck, back and legs)**

1. Neck,
   Heads lowered by more than 20^{o}, then the score = 2
2. Back
   Bent more than 60 degrees, then the score = 4
3. Legs
   Both legs stretch forward (score = 1), both legs bend (score is +2), the total score for legs = 3

Scores in Table A = 7 plus a load of 11-22 lbs, then the score A = 8
The assessment scores of Table A can be seen in Figure 6.

B. **Score B (arms and wrists)**

1. Upper arm
   Upper arms form an angle of 20-45^{o} (score = 2) and shoulders rise (+1), the total score for upper arm = 3.
2. Forearm
   Forearm flexion and extension of movements, score = 2.
3. Wrist
   Wrist flexion and extension of more than 15 degrees, score = 2.

Table A		Neck											
		1				2				3			
	Legs	1	2	3	4	1	2	3	4	1	2	3	4
Trunk Posture Score	1	1	2	3	4	1	2	3	4	3	3	5	6
	2	2	3	4	5	3	4	5	6	4	5	6	7
	3	2	4	5	6	4	5	6	7	5	6	7	8
	4	3	5	6	7	5	6	7	8	6	7	8	9
	5	4	6	7	8	6	7	8	9	7	8	9	9

Figure 3. Assessment Score REBA for Part A

Scores in Table B = 5, coupled with the coupling "fair" then the score of B = 6
As Table B assessment scores can be seen in Figure 4.

Table B		Lower Arm					
		1			2		
	Wrist	1	2	3	1	2	3
Upper Arm Score	1	1	2	2	1	2	3
	2	1	2	3	2	3	4
	3	3	4	5	4	5	5
	4	4	5	5	5	6	7
	5	6	7	8	7	8	8
	6	7	8	8	8	9	9

Figure 4. REBA Assessment Score forTable B

Then obtained a score in table C = 10. As Table C assessment scores can be seen in Figure 5.

Score A (score from table A +load/force score)	Table C: Score B, (table B value +coupling score)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	2	3	3	4	5	6	7	7	7
2	1	2	2	3	4	4	5	6	6	7	7	8
3	2	3	3	3	4	5	6	7	7	8	8	8
4	3	4	4	4	5	6	7	8	8	9	9	9
5	4	4	4	5	6	7	8	8	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10
7	7	7	7	8	9	9	9	10	10	11	11	11
8	8	8	8	9	10	10	10	10	10	11	11	11
9	9	9	9	10	10	10	11	11	11	12	12	12
10	10	10	10	11	11	11	11	12	12	12	12	12
11	11	11	11	11	12	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12

Figure 5. REBA Assessment Score for Table C

Coupled with repeated activity (+1), then REBA score = 11 indicating that "it has a very high risk and needs a change"

Tools Designing

REBA rate on the initial *gedogan* looms indicated the need for a new tool design. The design of the new loom was done with anthropometric approach.

The design would also be done by considering the body parts pain complaints of craftsmen. These body parts were: the upper neck, arms, buttocks, elbows, wrists, and part of the foot, as well assore muscle fatigue at the upper neck, shoulders, arms, thighs, knees, calves, ankles and feet.

The size of the new loom was determined by using craftsmen anthropometry. Body dimensions used were TBD (High Shoulder Sitting), TSD (High Elbow Lounge), TPO (High Polipteal), PP (Butt Polipteal), PKL (buttocks to knee), TP (Thick Thighs) and TMD (High-Eye Lounge).

Table 3.Estimated Percentile of Body Dimensions

No.	Body dimensions	Percentile Size	Percentile Values
1	TBD	P50	609.90 cm
2	TSD	P50	128.46 cm
3	TPO	P5	158.01 cm
4	PP	P5	210.16 cm
5	PKL	P5	43.54 cm
6	TP	P5	35.55 cm
7	TMD	P5	102.72 cm

The desired final data from the body dimension data was the percentilevalue. Body dimension data obtained should be statistically tested. Thus, the average value, standard deviation, maximum and minimum values should be calculated.

Table 4. Average Value, Standard Deviation, Maximum Value, and Minimum Value of Each Body Dimension

No.	Dimension	$\bar{X}$	S	xmax	xmin
1	TBD	53.538	11.392	67	30
2	TSD	33.154	5.383	39	22
3	TPO	41.692	7.052	49	26
4	PP	37.846	5,289	43	26
5	PKL	45.923	7.285	55	30
6	TP	14.154	2.512	16	8
7	TMD	61.385	12.751	69	32

The data uniformity test of TSB body dimensions is:

$$BKA = \bar{X} + 1,96\,s = 53,538 + (1,96)(11,392) = 75,866$$

$$BKB = \bar{X} \quad 1,96s = 53,538 \quad (1,96)(11,392) = 31,211$$

Results of the uniformity test of the data are shown in Table 3.

Table 3. Uniformity Test Result

Dimension	$\bar{X}$	S	xmax	xmin	BKA	BKB	Information
TBD	53.538	11.392	67	30	75.866	31.211	Uniform
TSD	33.154	5.383	39	22	43.704	22.604	Uniform
TPO	41.692	7.052	49	26	55.514	27.480	Uniform
PP	37.846	5,289	43	26	48.213	27.480	Uniform
PKL	45.923	7.285	55	30	60.202	31.644	Uniform
TP	14.154	2.512	16	8	19.076	9.231	Uniform
TMD	61.385	12.751	69	32	86.377	36.393	Uniform

Modifications made on the *gedogan* looms are shown in Figure 6.

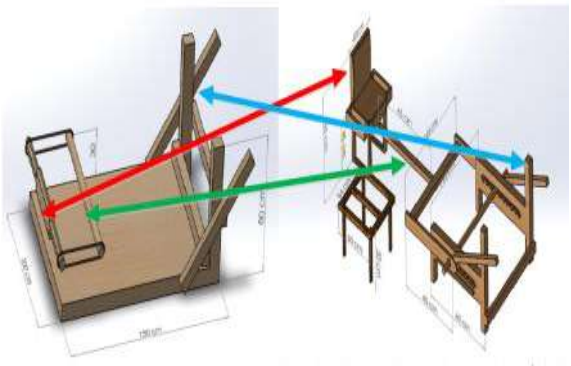


Figure 6. Modification of Gedogan Looms

Based on Figure 6 it can be seen that the modifications carried out on:

1. Red arrow lines (↔)
   Additional seat, which can be adjusted to its proximity by using a supporting part

2. Blue arrow lines (↔)
   Changes in dimensions of*tundaran*, *tagabe* and *tamapan* adjusted to the height of the chair
3. Green arrow lines (↔)
   The addition of a supporting part function on the seat is useful to tighten yarn when weaving the fabric on *sidurukan*. *Sidurukan* dimensions can also be adjusted.

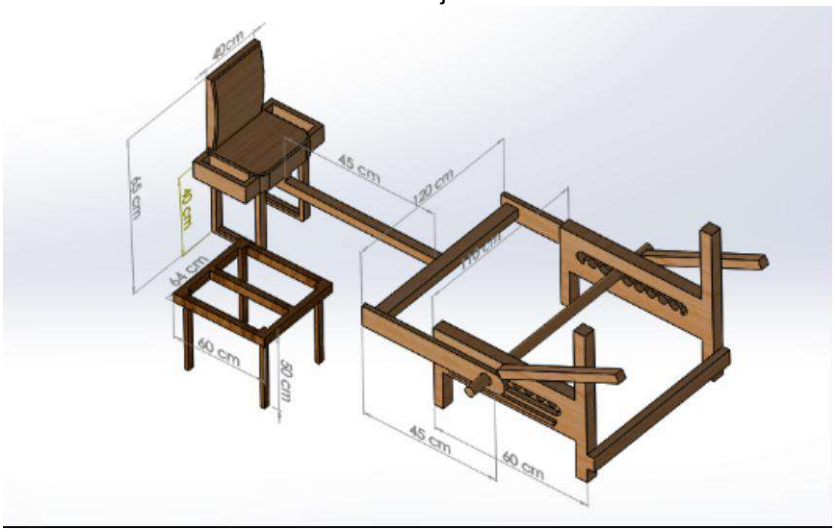


Figure7. New Design of *Gedogan*Looms

C. Equipment Testing

The new loom that had been designed with anthropometric approach, was then tested by the craftsmen. Based on the results obtained from REBA calculation, the score dropped to 4. The decrease was due to several things. For example, the supporting part that replaced the function of the foot on the old instrument, the seats reduced the bending movement at work, and the dimensions of the tools that had been adapted to the worker's body would be very helpful for artisans in weaving without having attempted to reach farther because the size of the tool was not suitable.

Improvement

Improvement was done by doing development work facility design as seen in Figure 9. Figure 8 shows working posture after design improvement.

Figure 8. Design Repair Work Facilities

Information:

A. Score A (neck, back and legs)

1. Neck
   Neck lowered at 20^{o}, then the score = 1
2. Back

Bowing 0 - 20°, then the score = 2

3. leg
   Feet parallel forward, then the score = 1

Scores in Table A = 2 plus a load of 11-22 lbs(+1), then the score of A = 3.

Table A		Neck											
		1				2				3			
	Legs	1	2	3	4	1	2	3	4	1	2	3	4
Trunk Posture Score	1	1	2	3	4	1	2	3	4	3	3	5	6
	2	2	3	4	5	3	4	5	6	4	5	6	7
	3	2	4	5	6	4	5	6	7	5	6	7	8
	4	3	5	6	7	5	6	7	8	6	7	8	9
	5	4	6	7	8	6	7	8	9	7	8	9	9

Figure 9. Assessment Score of REBA for Table Aafter Improvement

B. Score B (arms and wrists)

1. Upper arm
   The upper arm forms an angle of 20-45°, the score = 2
2. Forearm
   Forearm flexion and extension movements 60-100°, then the score = 1
3. Wrist
   Wrist flexion and extension of more than 15 degrees, then the score = 2

Scores in Table B = 2, plus coupling rating of "good" (+0), then the score B = 2.

Table B		Lower Arm					
		1			2		
	Wrist	1	2	3	1	2	3
Upper Arm Score	1	1	2	2	1	2	3
	2	1	2	3	2	3	4
	3	3	4	5	4	5	5
	4	4	5	5	5	6	7
	5	6	7	8	7	8	8
	6	7	8	8	8	9	9

Figure 10. Assessment Score of REBA for Table B after Improvement

Meanwhile, the obtained scores in Table C = 3, coupled with repeated activity (+1). Then, the score of REBA = 4 which indicates "medium risk" which means that further investigation should be done quickly to make changes.

Score A (score from table A +load/force score)	Table C: Score B, (table B value +coupling score)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	2	3	3	4	5	6	7	7	7
2	1	2	2	3	4	4	5	6	6	7	7	8
3	2	3	3	3	4	5	6	7	7	8	8	8
4	3	4	4	4	5	6	7	8	8	9	9	9
5	4	4	4	5	6	7	8	8	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10
7	7	7	7	8	9	9	9	10	10	11	11	11
8	8	8	8	9	10	10	10	10	10	11	11	11
9	9	9	9	10	10	10	11	11	11	12	12	12
10	10	10	10	11	11	11	11	12	12	12	12	12
11	11	11	11	11	12	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12

Figure 11. Assessment Score of REBA for Table C after Improvement

4. CONCLUSION

Work facilities improvement by developingnew design for*gedogan* loom with anthropometry approach can improve work posture from the condition of "very high risk and needs implement change" to "medium risk". It indicates the improvement of work that will encourage increased labor productivity.

ACKNOWLEDGMENT

The authors gratefully acknowledge that the present study is supported by DP2M Program ofUniversity of Sumatera Utara on Poject of PokjaDanau Toba-LembagaPengabdian. The implementation of the study is very beneficial for the weaving comunityinSamosir area, especially in LumbanSuhi-Suhidistrict.

REFERENCES

Belliapa CC, "A review on ergonomic tools to assess physical risk in garment manufacturing industries", IJMPE, 2014, Vol 2 (4), pp 51-53.

F. Fatimah, "Determining the level of occupational risks by using REBA score", Industrial Engineering Journal, 2012, Vol 1, No. 1, pp 25-29.

G.Askin and Jeffrey Ronald B. Goldberg.Design and Analysis ofLean Production System. 2001. USA: John Wiley & Sons, Inc.

Parasti, Novena Ayu, PosturKerja Analysis on Industrial Pottery. 2010. Yogyakarta: UAJY

S. Wignjosoebroto, "Ergonomics time and motion studies", 2008, Surabaya: Publisher WidyaGuna.

SE Kazemi, S. SAVAS, L. Aydos, "Evaluation of ergonomic postures of physical education and sport science by reba and its relation to prevalence of musculoskeletal disorders", IJSCS, 2016, Vol 4 (3), pp 260-266

Shigeo Shingo, A Revolution in Manufacturing: The SMED System, 1985, 1985, UK: Productivity Inc., Page 26-27.

Sutalaksana, Iftikar Z, et al. Mechanical Working Procedures. Bandung: Department of Industrial Engineering Bandung Institute of Technology. 1979.

Self-Esteem and Health-Related Quality of Life Among Adolescent *Santri*

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Article Info

Keyword:

Self-esteem
Health-related quality of life
Adolescent *santri*

ABSTRACT

Santri is a term used to describe students who study about common knowledge and Islamic religion at the same time in an Islamic boarding school. *Santri* have to spend their 24-hours a day in the boarding school with other students. The schedule in Islamic boarding schools is very tight. *Santri* have to achieve the target set by the school in Al-Qur'an recital. *Santri* come from various backgrounds. *Santri* also have to face the turmoil of adolescence time. Those conditions make the lives of adolescent *Santri* more dynamic. This study aimed to examine the relationship between self-esteem and health-related quality of life in adolescent *Santri*. The hypothesis proposed in this research was there is positive relationship between self-esteem and health-related quality of life in adolescent students in Islamic boarding school "X" and Islamic boarding school "Y". The respondents were 115 *Santri* (46 girls and 69 boys) aged 12-16 years. The scales used in this study were Health-Related Quality of Life Scale and Rosenberg Self-Esteem Scale. The results of the analysis showed that there was a significant positive relationship between self-esteem and Health-Related Quality of Life on adolescent *Santri* (r = 0.626; p = 0,000).

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1. INTRODUCTION

Islamic Boarding School locally later here called as *Pesantren* is one of institutions that are able to bring a significant effect on education world, either physically, spiritually or intellectually. This is in the view of the religious values and norms to become an ideal reference for the *Santri* (students in *Pesantren*) to think and behave (Sanusi, 2012). The aim of *Pesantren* is to create and improve the personality of the *Santri* in accordance with Islamic values: nobleness, independence, steadfastness, and usefulness for her/himself, society and State (Mumtahan, 2015). Further explained by Sanusi, *Santri* is someone living in *Pesantren* and is able to follow any rules applied in it. All processes of activities in *Pesantren* are monitored by the one called *Kyai* (Sanusi, 2012).

The systems in *Pesantren* include the obligation of *Santri* to stay in the dormitory. It means that a *Santri* must stay away from family, including parents that previously become the one controlling the social intercourse, attitude, or development of a child. In *Pesantren*, the role of parents will be taken over by the Supervisor and Management of *Pesantren* that are in charge of guiding and monitoring the attitude, social intercourse and development of *Santri* during their living in *Pesantren*. Other systems applied in *Pesantren* include any restrictions in using facilities, such as telecommunication devices. Also, there are some very tight rules restricting the *Santri* starting from the time they wake up to they go back to sleep. *Santri* must be able to adjust him/ herself to anything that must be done together with other *Santri* such as eating, sleeping, going to

school, resting, reading Qur'an, studying and playing. Doing all things together can shape a new pattern for *Santri* in which they will learn how to build and develop a social relationship with new friends and find the way to face any challenges or demands in school and in *Pesantren* altogether (Rahmanita, 2015; Hidayati, 2016; Safitri, 2016).

The researcher conducted the observation and interview to observe the life in *Pesantren*. The result of observation showed that all *Santri* ate together in one plate and wore the clothes alternately with their peers. It was also found that there was a lack of awareness of *Santri* to throw the garbage in the right place, and lack of time for resting for the *Santri* due to the very tight schedules. From the interview, it was found that many *Santri* were suffering from diarrhea, gastritis and skin disease such as *scabies*. In addition, the *Santri* sometimes felt bored and stressed for the very tight schedule which was started from 3 a.m. to 9 p.m. *Santri*, compared to other ordinary students, were also under pressure with the tasks that were twice harder, including the academic tasks in school and the tasks to annually follow the graduation for Holy Qur'an recitation. *Santri* were only given a chance to see their family twice a month. The *Pesantren* where the researcher did the observation and interview in had approximately 2000 *Santri* (males and females). This caused the lack of facilities of classrooms and rooms to properly accommodate all *Santri*. The school environment was inadequate to support the learning activities as one room had been divided into two classrooms by using plywood. From this explanation, it can be stated that the life quality of *Santri* was categorized low in the following aspects; health, psychology, and school environment condition. This is in line with the previous research in which stated that many things have changed after a teenager feels a life in *Pesantren* such as healthy lifestyle, educational level, and social interaction with peer or parents and psychological condition (Purwanto, 2016). Furthermore, Purwanto explained that the changes faced by the *Santri* would influence their life quality(Purwanto, 2016). Muhaimin Stated that the life quality refers to *overall sense* – prosperity of an individual covering the entire happiness and life satisfaction aspect and it is more subjective rather than specific or objective (Muhaimin, 2010). The difference between the life quality and HRQOL itself can be seen from the aspect or dimension building both concepts. As stated by WHO, the aspect of life quality consists of physical health, psychology of social-environment interaction (WHO, 1998). HRQOL is built by a number of dimensions including physical, psychological, social and spiritual aspects in life (Eiser, 2001).

Health-Related Quality of Life (HRQOL) is commonly conceptualized as a multidimensional construct covering a number of domains and more admitted as a measurement of health result that is the most important point in the pediatric research (Ravens-Sieberer, 2005). The concept of HRQOL resembles the definition proposed by WHO that health is not only perfect due to the absence of disease or physical disorder but also means health psychologically, mentally and in social prosperity. HRQOL in teenager is defined as a multidimensional concept that covers four dimensions: emotional, physical, social and environment or school rules (Ravens-Sieberer, 2006).

WHO reveals that health in teenager is a significant determiner for the prosperity in that age and in future; while, according to Connolly and Jhonshon the recent a lot of research on HRQOL are focused on adult – not on children or teenagers (Hong, 2007). Hence, a measurement for HRQOL is deemed necessary to be one of the intervening forms to observe to what extent the life quality of teenagers in the perspective of dimensions building HRQOL and as an attempt to keep the life sustainability for teenagers and later adult (Ravens-Sieberer, 2006). The high HRQOL indicates that an individual has a life quality related to good health particularly in the aspect of health and achievement in health assessment and intervention in medical world (Philips, 2008).

There are two factors influencing the *Health-Related Quality of Life* on teenagers; those are individual characteristics and social characteristics (Gasper, 2011). The individual characteristics influencing HRQOL include *self-esteem*, optimism, coping strategy, resilience and emotional management (Wrosch, 2003). One of the ways how the individual characteristic can influence the HRQOL in teenagers is related to the fact that this characteristic can give a continual feeling, stability or consistency when one does something, thinks and experiences something (Wrosch, 2003).

Rosenberg defines self-esteem as a form of positive or negative evaluation of human to him or herself (Tafarodi, 2001). According to Fenzel, the consequence of low self-esteem for some teenagers can lead to certain problem such as depression, suicide, anorexia nervosa, juvenile delinquency and other problems in self-adaptation (Santrock, 2007). Rosenberg revealed that an individual with low self-esteem frequently experiences depression and unhappiness, high anxiousness, showing higher aggressiveness, emotional and malicious, and always suffers due to dissatisfaction towards his/ her life (Tafarodi, 2002). A study by Potoka shows that self-esteem is one of determining factors for life satisfaction, meaning that it also determines and assesses the level of life quality of an individual (Farshi, 2013).

The understanding about self-esteem becomes essential to improve the HRQOL among adolescent *Santri*. Adolescent *Santri* with high self-esteem will have high confidence in themselves so that they do not have a bad perspective about themselves, are more grateful, accept the positive and negative aspects in themselves, and make an effort to maintain their physical and psychological health (Ramadhan, 2012). In addition, adolescent *Santri* will be easier to build or adjust them to have a social relationship with the environment as they believe that they are quite valuable to be capable of communicating or building relationship with others (Pritaningrum, 2013). Students can also be more optimistic in solving various challenges faced during adolescence period as they are able to think positive and have the confidence that they are competent and able to solve any existing problems (Aisyah, 2015).

Based on previous points, it can be observed that individuals with high self-esteem will have good physical, emotional, psychological and social conditions that will bring an impact on HRQOL status. Based on the background described earlier, the researcher is interested to examine the relationship between self-esteem and Health-Related Quality of Life (HRQOL) on adolescent *Santri*. This research comes to be different as its subject is students in an indigenous Islamic education institute of Indonesia (Suwendi, 2016).

2. RESEARCH METHOD

2.1 Research Design

This research used a quantitative approach with correlational research method.

2.2 Research Subject

The subject used in this study is early adolescent *Santri*, aged 12-16 years, both female and male living in Islamic Boarding School in Yogyakarta and Central Java. The subject selection was based on convenience sampling (Babbie in [24]).

Data Collection Method

The scale used to measure HRQOL is Kidscreen compiled by Ravens based upon ten dimensions of HRQOL of adolescents; namely physical wellbeing/health, psychological well-being/maturity, mood and emotions, self-perception, independence, relationship with parents and household life, social and group support, school environment, school admission/ bullying as well as financial resources (Ravens-Sieberer, 2006). The HRQOL scale consisted of 52 question items supporting the (favorable) research variables. This scale used a Likert scale model with five answer options. One example of the question is *"have you felt fit and well?".*

The scale used to measure self-esteem was RSES (Rosenberg Self-Esteem Scale) compiled by Rosenberg [18] based upon two aspects: self-competence and self-liking. This scale consisted of 10 items which were divided into 5 favorable and 5 unfavorable items. This scale used a Likert scale model with five answer options. One example of the question is *"On the whole, I am satisfied with myself".*

Before the scale is distributed, the researcher did the process of translation and adaptation of the instruments following the back-translation steps (Douglas, 2007).

3. RESULTS AND ANALYSIS

There are two types of Islamic boarding school in Indonesia: traditional or semi-modern with the *Salaf* teaching (the teaching of the Qur'an or the Yellow Book entirely) and a modern Islamic boarding school combining religious teaching with general teaching using modern teaching system (Aisyah, 2015). The research was conducted in two *Pesantren* locations in Central Java and Yogyakarta, namely *Pesantren* X in Kendal, Central Java and *Pesantren* Y in Sleman, Yogyakarta. *Pesantren* X has been established since December 16, 1998. It is a boarding school that upholds the Qur'an values with approximately 200 *Santri*. *Pesantren* Y has been established since December 20, 1975 and it is one of the best Islamic boarding schools and schools in Yogyakarta with more than 2000 students, either as a *Santri* in Madrasah Tsanawiyah (MTs) and or as a *Santri* in Madrasah Aliyah (MA). Meanwhile, *Pesantren* X and *Pesantren* Y are the traditional Islamic boarding school as they prioritize memorizing Al-Qur'an and upholding the values of Al-Qur'an.

3.1. Validity and Reliability of Measurement Tools

In the scale of HRQOL, the correlate item-total correlation coefficient was between 0.252 and 0.657 with Cronbach Alpha reliability coefficient of 0.898. In RSES Scale, the valid Coefficient of correlate item-total correlation was between 0.351 and 0.586 with Cronbach Alpha reliability coefficient of 0,768.

3.2. Description of Research Subject

The total number of the respondents of this research was 115 respondents. The general overview of the research respondents is presented as follows.

Table 1. *Description of the Respondent by Sex*

No.	Sex	Number	Percentage
1.	Male	46	39%
2.	Female	69	61%
	Total	**115**	**100%**

Based on Table 1, there were 46 male *Santri* with a percentage of 39% and 69 female ones with a percentage of 61%.

3.3. Result of Assumption Test

a. Normality Test

Researcher did the normality test using *Test of Normality Kolmogorov-Smirnov*

Table 2. *Result of Normality Test*

Variable	P	Category
Health-Related Quality of Life (HRQOL)	0,200	Normal
Self-Esteem	0,200	Normal

As shown in Table 2, the results of the normality test of both scales indicated that two scales were normally distributed. The HRQOL scale showed coefficient p = 0.200 (p > 0.05) and the RSES scale obtained the coefficient p = 0.200 (p > 0.05).

b. Linearity Test

Table 3. *Results of the Linearity Test*

Variables	Linearity Coefficient (F)	Significance (p)	Remarks
Health-Related Quality of Life (HRQOL) with Self-Esteem	79.339	0,000	Linear

Based on Table 3, the results of the linearity test from health-related quality of life and self-esteem has fulfilled the assumption of linearity with F value of 79.339 ($p > 0.05$) with $p = 0.000$ ($p < 0.05$).

c. Hypothesis Test

Table 4. *Results of Hypothesis Test*

Variable	R	P	Remark
Health-Related Quality of Life (HRQOL) with Self-Esteem	0.643	0.000	Significant

As shown in Table 4, the result of the analysis on the correlation between health-related quality of life and self-esteem showed the value of $r = 0.626$ with $p = 0,000$ ($p < 0.01$). This indicates that there is a significant correlation between those two research variables. Thus, the hypothesis proposed in this research is **accepted.**

Table 5. *Results of the Correlation Test by Sex*

Variable	R	P	Remarks
Health-Related Quality of Life (HRQOL) with Self-Esteem in Male *Santri*	0.669	0.000	Significant
Health-Related Quality of Life (HRQOL) with Self-Esteem in Female *Santri*	0.666	0.000	Significant

As shown in Table 5, the result of correlation between Health-Related Quality of Life variable and self-esteem variable in male resulted in $r = 0.669$ with $p = 0.000$ ($p < 0.01$), while female resulted in $r = 0.666$ with $p = 0.000$ ($p < 0.001$). This showed no difference between male and female subjects.

Researchers conducted an additional analysis by carrying out an analysis of difference test. This test was conducted to find out the difference in Health-Related Quality of Life level and self-esteem in the subject of male and female teenage *Santri*. The calculation on T-test analysis used Independent Sample T-test. The difference test results by sex are presented in the following table.

Table 6. *Difference Test on Health-Related Quality of Life by Sex*

Research Variable	Descriptive Statistics		*Levene's Test for Equality of Variances*		
	Male	Female	T	Sig. (2-tailed)	Desc.
Health-Related Quality of Life (HRQOL)	M = 154.82	M = 157.37	0.900	0.370	No Difference
Self-Esteem	M = 27.913	M = 26.087	2.549	0.012	Different

As shown in Table 6, the result of assumption test that has been done by distributing the scores of Health-Related Quality of Life and self-esteem in male and female adolescent *Santri* are normal and

homogeneous. In the Health-Related Quality of Life variable (HRQOL), we obtained the value of t = 0.900 with p = 0.370, p> 0.05. This showed no difference in Health-Related Quality of Life in male and female adolescent *Santri*. On the other hand, from the self-esteem variable, we obtained t value = 2.549 with p = 0.012, p <0.05 indicating the differences in self-esteem between female adolescent *Santri* and male ones.

DISCUSSION

The correlation between self-esteem and Health-Related Quality of Life (HRQOL) indicates that self-esteem is one thing that can affect HRQOL of adolescent *Santri*.] The personal characteristics that may affect HRQOL of teenagers consist of self-esteem, self-concept, extraversion and introversion, locus of internal control, life orientation (attitude of optimism vs. negativism) and healthy behavior (Ravens-Siberer, 2005; Gasper, 2012). This is supported by the statement of Wrosch and Scheier's [26] stating that individual characteristics can keep a sense of continuity, stability or consistency about how one behaves and thinks.
Sex is one of the factors affecting HRQOL of teenagers (Gasper, 2011). Adolescent female had lower HRQOL compared to the adolescent males in which adolescent female had a negative perception about their bodies and more concerned with their appearance to be attractive. It is different with the results of this research finding no difference between male and female (Bisegger, 2005).

In line with the results of the correlation test, the different test conducted on variable HRQOL by sex indicated no significant difference between male teenage *Santri* and female ones. Based on the result of different test, t = 0.900 with p = 0.370 (p > 0.05) indicating no significant difference between HRQOL of male and female adolescent *Santri*. This is supported by a research conducted by Lundberg, showing that there was no significant difference between health-related quality of life in adolescent male and female aged between 14 and 18 years (Lundberg, 2012).

The results of additional analysis by sex were also performed in variable self-esteem. The statistical different test showed a difference of self-esteem between male and female adolescent *Santri* as seen from t value = 2.549 with p = 0.012 (p < 0.05). In addition, the Mean value of male respondents was higher by 27.913 compared to female respondents which was by 26.087, indicating that male adolescent *Santri* had the higher self-esteem compared to the female ones. This is supported by the statement of Frost & McKelvie stating that males have higher self-esteem scores compared to the female ones. This then causes the females in the adolescence period to be prone to dissatisfaction with the image of their body (Agam, 2015). Emler also revealed that the bigger shape and strength of teenage male's body has made the adolescent female to be weaker in physical problems as this also affects the self-esteem of teenage male and female (Emler, 2002).

The weakness of this research is the lack of theory that can explain the relationship between HRQOL and self-esteem comprehensively. This is because the theories that researchers got to explain both variables focusing on the body (dis)satisfaction, whereas HRQOL is so multidimensional that the discussion should be able to explain the research findings more clearly.

4. CONCLUSION

The results of this research indicated a significant positive relationship between self-esteem and Health-Related Quality of Life (HRQOL) in adolescent *Santri*. This shows that the higher the self-esteem, the higher the Health-Related Quality of Life teenage *Santri*. Conversely, the lower the one's self esteem, the lower the Health-Related Quality of Life that the teenage students will have. Based on this point, the hypothesis proposed in this research is accepted, showing a positive relationship between self-esteem and Health-Related Quality of Life on adolescent *Santri*. Further research is expected to explore more deeply issues related to the theories relevant with Health-Related Quality of Life and self-esteem in *Santri*.

REFERENCES

Agam, R., Tamir, S. & Golan, M.;, "Gender differences in respect to self-esteem and body image as well as response to adolescents' school-based prevention progams", *Journal of Psychology and Clinical Pschiatry,* vol.2, no.5, pp.1-7, 2015.

Aisyah, S., Yuwono, S. & Zuhri, S.;, "Hubungan antara *self-esteem* dengan optimisme masa depan pada siswa *Santri* progam tahfidz di Pondok *Pesantren* Al-Muayyad Surakarta dan Ibnu Abbas Klaten", *Jurnal Indigenous,* vol.13, no.2, pp.1-8, 2015.

Bisegger, C., Cloetta, B., von Rueden, U., Abel. T., Ravens-Siberer, U., & European Kidscreen Group.;, "Health-related quality of life: Gender differences in childhood and adolescents", *Soz Praventivmed,* vol.50, no.5, pp.281-291, 2005.

Creswell, J. W.;, "*Research design: Pendekatan kualitatif, kuantitatif, dan mixed",* (penerjemah Achmad Fawaid). Yogyakarta: Pustaka Pelajar, 2015.

Douglas, S. P., & Craig, C. S.;, "Collaborative and iterative translation: An alternative approach to back-translation", *Journal of International Marketing,* vol.15, no.1, pp.30-43, 2007.

Eiser, C., & Morse, R.;, "A review of measure of quality of life for children with chronic illness", *Arch Dis Child,* vol.84, no.3, pp. 205-211, 2001. doi: https://dx.doi.org/10.1136%2Fadc.84.3.205

Emler, N.;, "Self-esteem: The cost and causes of low self-esteem", *Youth Studies Australia,* vol.21, no.3, pp.45-48, 2002.

Farshi, M. G., Sharifi, H. P., & Rad, M.A.;, "The relationship between self-esteem, mental health and quality of life in patients with skin disease", *Asian Journal of Medical and Pharmaceutical Researches,* vol.3, no.2, pp.50-54, 2013.

Gaspar, T., Ribeiro, J. P., de Matos, M.G., Leal, I., & Ferreira, A.;, "Health-related quality of life in children and adolescents: Subjective Well Being", *Spanish Journal of Psychology,* vol.15, no.1, pp.177-186, 2012.

Gaspar, T., Ribeiro, J. P., de Matos, M. G., & Leal, I.;, "Psychological well-being and health-related quality of life in children and adolescents: Focus group methodology", *Journal of Child and Adolescents Psychology,* vol.4, pp.133-149, 2011.

Hidayati, W.;, "Pelatihan konselor sebaya pada pengurus *Santri* junior MA Pandanaran", Sleman: Laporan Praktek Kerja Profesi Psikolog, Magister Profesi Psikolog bidang Psikolog Klinis, Universitas Islam Indonesia, 2016.

Hong, S. D., Yang, J. W., Jang, W. S ., Byun, H., Lee, M. S., Kim, H. S., Oh, M. Y., & Kim, J. H.;, "The KIDSCREEN-52 quality of life measure for children and adolescents (KIDSCREEN-52-HRQOL): Reliability and validity of the Korean version", *Journal Korean Medical Sciences,* vol.22, no.3, pp.446-452, 2007.

Lundberg, V., Lindh, V., Eriksson, C., Petersen, S., & Eurenius, E.;, "Health-Related Quality of Life in Girls and Boys with Juvenile Idiopathic Arthritis: Self- and Parental Reports in a Cross-Sectional Study", *Pediatric Rheumathology,* vol.10, no.33, pp.1-7, 2012. doi: https://doi.org/10.1186/1546-0096-10-33

Muhaimin, T.;, "Mengukur kualitas hidup anak", *Jurnal Kesehatan Masyarakat Nasional,* vol. 5, no.2, pp. 51-55, 2010.

Mumtahanah, N.;, "Pengembangan sistem pendidikan *Pesantren* dalam meningkatkan profesionalisme *Santri*", *Jurnal Studi Keislaman – 'Al-Hikmah',* vol.5, no.1, pp.54-70, 2015.

Phillips, D.;, "*Quality of life: Concept, policy and practice*", New Yok: Routledge, 2008.

Pritaningrum, M., & Hendriani, W.;, "Penyesuaian diri remaja yang tinggal di Pondok *Pesantren* Modern Nurul Izzah Gresik pada tahun pertama", *Jurnal Psikologi Kepribadian dan Sosial,* vol.2, no.3, pp.134-143, 2013.

Purwanto, N. F.;, "*Hubungan antara penyakit skabies dengan tingkat kualitas hidup Santri di Pondok Pesantren Al-Muayyad Surakarta*", Surakarta: Skripsi program sarjana, Fakultas Kedokteran, Universitas Muhammadiyah Surakarta, 2016.

Rahmanita, A.;, "Pembentukan konselor sebaya di *Pesantren* X", Sleman: Laporan Praktek Kerja Profesi Psikolog, Magister Profesi Psikolog bidang Psikolog Klinis, Universitas Islam Indonesia, 2015.

Ramadhan, Y. A.;, "Kesejahteraan psikologis pada remaja *Santri* penghafal Al-Qur'an", *Psikologika,* vol.17, no.1, pp.27-38, 2012.

Ravens-Sieberer, U., Gosch, A., Rajmil, L., Erhart, M., Bruil, J., Duer, W., Auquier, P., Power, M., Abel, T., Czemy. L., Mazur, C., Czimbalmos, A., Tountas, Y., Hagguist, C., Kilroe, J. & Kidscreen Group E. "KIDSCREEN-52 quality-of-life measure for Children and Adolescents", *Expert Review Pharmachoeconomics Outcomes Research*, vol.5, no.3, pp.353-364, 2005.

Ravens-Siberer, U., & The Kidscreen Group Europe.;, "The KIDSCREEN questionnaire: Quality of life questionnaire for children and adolescents (Handbook)", Lengerich: Pabst Science Publisher, 2006.

Santrock, J. W.;, "*Life-span development, 8th edition*", Boston:McGraw-Hill, 2007.

Sanusi, U.;, "Pendidikan kemandirian di Pondok *Pesantren* (Studi mengenai realitas kemandirian *Santri* di Pondok *Pesantren* al-Istiqlal Cianjur dan Pondok *Pesantren* Bahrul Ulum Tasikmalaya)," *Jurnal Pendidikan Agama Islam – Ta'lim,* vol.10, no.2, pp.123-139, 2012.

Safitri, S.;, "Pelatihan konselor sebaya pada PP Ash-Sholihah Jonggrangan", Sleman: Laporan Praktek Kerja Profesi Psikolog, Magister Profesi Psikolog bidang Psikolog Klinis, Universitas Islam Indonesia, 2016.

Suwendi.;, "*Pesantren* sebagai destinasi pendidikan islam global", Diakses 20 Januari 2018. Diunduh dari nu.or.id, 2016.

Tafarodi, R. W., & Swann Jr, W. B.;, "Two-dimensional self-esteem: Theory and measurement", *Personality and individual differences,* vol.31, pp.653-673, 2001.

Tafarodi, R. W., & Milne, A. B.;, "Decomposing global self-esteem", *Journal of Personality,* vol.70, no.4, pp.443-484, 2002.

WHO.;, "The World Health Organization quality of life assessment (WHOQOL): Development and general psychometric properties", *Soc Sci Med,* vol.46, no.12, pp.1569-1585, 1998.

Wrosch, C., & Scheier, M.F.;, "Personality and quality of life: The importance of optimism and goal adjustment", *Quality of Life Research*, vol.12, Suppl.1, pp.59-72, 2003.

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Maternal Compliance During Antenatal Care Visit at Primary Health Care Pekanbaru, Riau

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Article Info

Keyword:

Maternal compliance factors
Antenatal care
Primary Health Care

ABSTRACT

Antenatal Care is one of the important stages toward a healthy pregnancy to see the condition of the mother and fetus**.** Objective of this study was to determine maternal compliance factors during antenatal care visits (Age, education, knowledge and family support). Quantitative with cross sectional design. The sample of research was 207 pregnant women in Tenayan Raya Primary Health Care. The sample technique was Simple random sampling. The instrument used was a questionnaire. Data analysis techniques included univariate, bivariate with chi square test, and multivariate with multiple logistic regression. Results showed that, in pregnant women aged<20-> 35, there were 124 mothers who did not routinely have antenatal care visit, 117 mothers who had low education, 114 mothers who had low knowledge and 99 mothers who did get support from their families. Fourth factor bivariate analysis was related to maternal compliance (P value<0.05). In Multivariate Analysis, Age factor was the most dominant factor (OR 5,726). We discovered that there was a significant correlation between risk factors of age, low education, poor of knowledge and low family support toward maternal compliance. The age of pregnant woman was a dominant factor toward antenatal care visit. Health workers to be more proactive, to prepare special classes for pregnant women, to do home visits, and to educate pregnant women's families.

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1. INTRODUCTION

Antenatal Care (ANC) is a type of preventive treatment recommended for pregnant women that enables health workers to identify, prevent and treat health problems during pregnancy (Mkandawire, 2015; Villar J, 1997). During prenatal care, women at risk for complications are identified, where possible interventions are done to prevent the development of risks, pre-existing conditions and any resulting complications (Ochako, 2016; Villar J, 2001; Carolli G, 2001).

Globally, an estimated of 287,000 maternal deaths occur in 2010. Developing countries are accounted for 99% (284,000) deaths. Among the developing regions, Africa has the highest Maternal Mortality Rate (MMR) at 640 per 100,000 live births (WHO, 2012). The success of maternal health efforts, among them, can be seen from the indicator of Maternal Mortality Rate (MMR). MMR decline in Indonesia occurred from 1991 to 2007, from 390 to 228. But in 2012, there was a significant increase in MMR to 359 maternal deaths per 100,000 live births. In 2015, there were 305 maternal deaths per 100,000 live births based on a survey result (Profil Kesehatan RI, 2015). Globally, up to 358,000 women die annually due to labor complications which happen shortly after delivery (Hogan, 2010; WHO, 2013).

The effectiveness of the many components of this policy never exist, so it is possible to explain only the variation of frequency and standard of ANC visit only (Hajo, 1999). ANC visits are conducted monthly for the first 7 months, after which every two weeks for the eighth month and every week during the last month of pregnancy (Faudjar, 2006). There are many health care facilities, primarily at the primary care level in developing countries (Acta, 2003). The high utilization of ANC facilities is associated with low parity, poor obstetric history and distance to health facilities (Nielsen, 1995). To ensure the quality of ANC service delivery, namely K-1 (First visit) and K-4 (4th visit). The first and 2nd visits are done in trimesters 1 and 2. Then two more visits are done in the third trimester. Pregnant women who arrive

late for ANC treatment at Mulago hospital in Uganda are unaware of their pregnancy, the place where they should make their first visit and the significance of ANC visit (Kisuule, 2013).

To ensure a safe pregnancy, ANC 4th visit is recommended according to the standard (WHO, 2006; GHO,-;Petrou S, 2001). Assessment of maternal health services can be done by looking at K-1 and K-4 coverage. The gap between the effectiveness of ANC and changes in mortality observed at the national level has prompted the government to focus on service quality rather than on the scope of visits (Bryce J, 2013; Hodgins, 2014).

Based on Indonesia Health Profile Data in 2012, from 33 provinces in Indonesia, 19 provinces (57.6%) have reached the target. Riau Province is one of the unreached provinces with a Strategic Plan. The 4th ANC coverage is 86.04% (whereas the target was 100% in 2012) for the first visit and 95% for the 4th visit. Thus, to improve the pregnant women's visits, there are several factors concerning those who need attention. These factors are physical, psychological, environmental, social and cultural factors (Faudjar R, 2006).

The number of visits of pregnant women in Pekanbaru City based on data from Pekanbaru City Health Profile in 2013 were 24,028.The K-1 visits were 15,365 (63,9%) and the K-4 visits were 14,597 (60,7%). The lowest number of K-1 and K-4 visits wasin Tenayan Raya Public Health Center in Pekanbaru. In 2013, the number of ANC visits for K-1 was 77% and K-4 was 75%, so the target had not been reached (Dinas Kesehatan Pekanbaru, 2013)

The low compliance of the ANC visit is related to WHO's behavioral theory (Green L, 2005). Behavior, attitudes and knowledge will produce patterns in the way of life, which will be a habit that becomes culture in the acceptance of health services. There are several factors that influence human behavior such as thoughts and feelings (levels of knowledge, beliefs, attitudes, and perceptions), reference groups (community leaders, families, and health professionals), resources (facilities, money, time and energy), and life (habits and values). Based on these characteristics, the factors taken in this research are focused on mother's age, education, knowledge and family support. The purpose of the research is to know maternal compliance factors during ANC visit at Primary Health Care.

2. RESEARCH METHOD

This research used analytical quantitative study design with cross sectional analysis. The instrument used in this study was questionnaires to all respondents (door to door). The first step of the primary data collection process was giving informed consent form. After that, respondents were given explanations related to the questionnaire. The items included in the questionnaire covered information about age, education, mother's knowledge about ANC (10 items) and family support (5 items).The research was conducted at Tenayan Raya Primary Health Care. The population of the research was 896 people. The samples required for this research was 207 pregnant women. The sample was taken by simple random sampling. All respondents were in their 3rd trimester of pregnancy (28-36 weeks). While the primary data was obtained from questionnaires, the secondary data was obtained from medical records, textbooks, and other references. The data was analyzed using univariate analysis, bivariate using chi-square test, and multivariate analysis with multiple logistic regression test. The dependent variable was ANC visits compliance and the independent variables were age, education, knowledge and family support. The hypothesis of this study was there is a significant relationship between age, education, knowledge and family support and ANC visit compliance.

3. RESULTS AND DISCUSSION

In the univariate analysis showed, incompliance with ANC visits, the majority were aged <20->35 years old which were as many as 124 people, the majority of them had low education with a total number of 117 people, 114 people had a lack of knowledge as mothers and 99 of them did not receive family support (Table 1). From the result of bivariate analysis, all variables were 3 related variables, i.e. maternal age (p-value = <0.001), knowledge (p-value = 0.009), and family support (p-value = 0.001) (Table 1).

For multivariate analysis, the first few steps are bivariate selection to find out the variables that will be incorporated into multivariate modeling. Further examination (OR> 10%) is done by issuing a variable that p ≥ 0.05 value gradually from the p value which is very big. In this study, the outcomes at the end of modeling variables which were significantly related to completeness of maternal visitation compliance were age, education, knowledge and family support (Table 2)

Table 1. Antenatal care visit analysis in Primary Health Care (n=207)

Variable	Incompliance	Compliance	(*P Value*)	CI 95%
Age (yr)				
<20->35	124	42	< 0,001	5,694 (2,732-11,865
20-35	14	27		
Education				
Low	117	50	0,054	2,117(1,048-4,278)
High	21	19		
Knowledge				
Low	114	45	0,009	2,533(1,306-4,915)
High	24	24		
Family Support				
Low	99	32	0,001	2,935(1,609-5,353)
High	39	37		

Table 2. Main Determinant Factors of Antenatal Care Visit (n=207)

Variable	P value	OR	95% CI. For EXP (B)	
			Lower	Upper
Age (yr)	< 0.011	5,726	2,576	12,725
Education	0,011	2,849	1,272	6,384
Knowledge	0,018	2,495	1,173	5,306
Family Support	0,004	2,714	1,383	5,327

3.1. Pregnant age

The study showed that the age of pregnant women was significantly associated with ANC visit compliance, with age of<20 and> 35-year having 5.7 times higher tendency to ANC visits. This study is in line with other studies, showing that there is a significant association between age and utilization of ANC services (Barasa, 2015). Women who become pregnant at younger and older age have higher risk (Albertina, 2015). Pregnant women in the ANC follow significant changes due to growth, development (age) and interaction with background experience. Age range determines how good a woman with her parenting role is and follows ANC. If she is too young or too old, she may not be able to perform her role optimally.

One third of women want more or fewer visits than the standard schedule, and special attention should be paid to women with previous miscarriages or other labor complications (Hildingsson, 2002).Based on these results, pregnant women should be notifies that age has an important role in maternal health and well-being of the infant. It is advisable to plan a safe pregnancy in child-bearing age of 20-35 years. Meanwhile, for mothers aged <20 and> 35, they are encouraged to keep regular ANC visits for at least 4 times as recommended by World Health Organization (WHO).

3.2. Education

The potential of ANC to reduce maternal morbidity and improve the survival and health of newborns is widely recognized. However, there is a worrying gap in knowledge of the quality of ANC services (Gross, 2011). Patient education on the importance of ANC, especially among women of unfavorable social background, should be more effectively administered. The results are consistent with several other studies that there is a significant relationship between education and the completeness of ANC. Education and transport access also affect the results of utilization ANC (Muyunda, 2016; Ashraf-ganjoei, 2011).

Women with higher education tend to utilize ANC adequately than those with low education (Arthur, 2012). Therefore, to improve maternal education, there needs to be formal education as well as non-formal education, such as conducting pregnant women's classes in each Primary Health Care with midwives in partnership with health cadres. Therefore, pregnant women will be interested to visit and join them. ANC care pregnant women's classes can be done by health cadres through the network of pregnant women who are in Posyandu. ANC provides excellent opportunities for reaching pregnant women with prophylactic treatment, vaccination, infectious diseases diagnosis and treatment, as well as those with health education programs (Campbell, 2006). A prenatal education is realized in Poland to prepare for parenthood. The course program covers all psychophysical issues related to pregnancy, childbirth, and early childhoods (Krysa, 2016). However, research shows an imbalance between theory and practice in ANC classroom program.(Lee, 2009; Jaddoe, 2009).

Because education is important for dissemination, this education is often available in the form of individual or group sessions. However, individual education is often used by midwives and nurses, in particular, to help individuals understand health issues and their adaptability. On the other hand, group education allows group members to share their knowledge and experience (Reeder, 1997).

3.3 Knowledge

This study showed that knowledge is significantly related to maternal compliance so that the results showed that pregnant women with low knowledge had two times more compliant risk that those with high education. This study is in line with several other studies proving that there is a significant relationship between knowledge and completeness of ANC visits (Ye, 2010; Erlindawati, 2008).Knowledge and information has a positive relationship with enhancement and motivation to improve visits (Laminullah, 2015).Globally, 293,000 maternal deaths occurred in 2013, of which more than 99 % occurred in low- and middle-income countries (Melaku, 2014).

The low knowledge of pregnant women is one of the main causes of infant mortality or toddlers. Having good knowledge for pregnant women is very important because it can help them with their pregnancy, as well as help them with their physical preparation in the process of childbirth. In fact, there are many things that women must understand before deciding to plan for pregnancy, such as mental and physical readiness, and enough knowledge to undergo a pregnancy. By having good knowledge, the pregnant women will have healthier pregnancy and more optimum fetal growth. The model for the ANC emphasizes measures that are known to be effective in improving maternal and infant health, and improves information, especially in reminding pregnant women of health problems (Langer, 2002). Clients who are counseled provide information to other clients about alarming signs during pregnancy (Pembe, 2011).

Good communication is an important tool for midwives in the community, as it allows patients to share their experiences (Earle, 1995). Women's attitudes and knowledge of topics and actions related to maternity and antenatal and postnatal care may be very important. The Internet is one place to get all that information (Ladfors, 2001).

3.4 Family support

Satisfaction with maintaining health during pregnancy may have important implications for the quality of pregnancy and maternal delivery. Several studies have examined the factors that contribute to women's satisfaction with childbirth experience, focusing less on satisfaction with ANC services (Oakley, 1996). Husband's support and participation in pregnancy are proven to improve the readiness of pregnant women in the process of childbirth and even trigger the production of breast milk. The couples must be facilitated in undergoing and overcoming various diseases. It is also important to make a pregnant woman feel good, so she can rest and enjoy her pregnancy.

There is a relationship between family support and maternal compliance. Therefore, the role of antenatal care is to provide mother, husband and family guidance, to help them transition into parents (Abdollah pour, 2015). There is a need for health workers to provide family-oriented training and increase family support for coupled pregnant women in prenatal care programs (Oakley, 1996). From those studies, it is recommended to increase family support and train the family concerning with maternal health through pregnant women classes. Thus, the classes are not only for pregnant women but also for their participating husbands. Increased family support can also be done with a family approach through home visits. Approximately, five consultations are considered as sufficient for antenatal care. This limitis in connection with WHO study design which considers five check-ups as the minimum antenatal care (Villar, 2003). In addition, based on some research results, pregnant women have better obstetric outcomes after more than five consultations regardless their time and busyness (Beguin, 1996; Trujillo-Hernandez, 2002; Simoes, 2003). There are other risk factors, such as the socioeconomic conditions of the population, maternal health indicators, pregnancy complications and lack of ANC visits (Gudmundsson, 1997).

There are some lacks in this research including: the factors that become the variable of this study are still factors that explain characteristics of pregnant women. For further research, it is suggested to add predisposing factors (attitude, belief, perception) and reinforcing factors (environment, enabling factor, accessibility, rules or laws and medical skill) in antenatal care visits with quasi experiment design by dividing the two groups into control cases group and group with intervention to see the difference.

4. CONCLUSION

In this research, there was a significant correlation between age, education, knowledge and family support for ANC visit compliance where age was the most dominant factor affecting ANC visit compliance. Some recommendations based on the results of this study include suggesting health workers, especially midwives, to be more active in their duties to provide health services for antenatal care for early detection of maternal health during pregnancy through cooperation with health cadres, maternal classes, home visits and maternal health care family trainings. It is intended that pregnant women complete an ANC visit for at least 4 times during pregnancy. Hopefully, this will also improve the health of mothers and babies so as to reduce maternal and infant mortality.

ACKNOWLEDGEMENTS

We would like to thank all respondents of this study, Primary Health Care Tenayan Raya Pekanbaru Riau and staff, Head of Research Institute and Community STIKes Hang Tuah in Pekanbaru Riau for their cooperation.

REFERENCES

Abdollahpour, S., Ramezani, S. & Khosravi, A.,Perceived Social Support among Family in Pregnant Women. Int J Pediatr, 3(21), pp.879–888, 2015

Acta Obstetric Gynecology Scand., 'The WHO antenatal care model : the defects', ISSN 0001-63498 2(10), pp. 1063–1064, 2003

Albertina, M. & Sipasulta, G.C., Social Support in the Utilization of Antenatal Care Based On Customer Driven., 4(6), pp.18–22, 2015

Arthur, E,. Wealth and antenatal care use: Implications for maternal health care utilization in Ghana. Health Economics Review, 2(1), pp.1–8, 2012

Ashraf-ganjoei, T., Mirzaei, F. & Anari-dokht, F., The relationship between prenatal care and the outcome of pregnancy in low-risk pregnancies. Open Journal Of Obstetrics and Gynecology, pp.109–112. Available at: http://www.scirp.org/journal/ojog/, 1(September), 2011

Barasa, K.S., Wanjoya, A.K. & Waititu, A.G., Analysis of Determinants of Antenatal Care Services Utilization in Nairobi County Using Logistic Regression Model., 4(5), pp.322–328, 2015

Beguin F., Surveillance de la grossessedans le cadre de la nouvelleLAMal. Arch GynecolObstet 259 (Suppl) 84–87, 1996

Bryce J, Arnold F, Blanc A, Hancioglu A, Newby H, Requejo J, Wardlaw T., Measurement CWGoIC. Measuring coverage in MNCH: new findings, new strategies, and recommendations for action.PLoS Med, 10(5):e1001423, 2013

Campbell OM, Graham WJ, Strategies for reducing maternal mortality: getting on with what works. Lancet, 368:1284-1299, 2006

Carroli G, Villar J, Piaggio G, Khan-Neelofur D, Gulmezoglu M, Mugford M, Lumbiganon P, Farnot U, BersgjøP:, WHO systematic review of randomized controlled trials of routine antenatal care. Lancet, 357:1565-1570, 2001

Dinas Kesehatan Pekanbaru, Profil Dinas Kesehatan Pekanbaru tahun 2013.

Earle, S., Hons, B. A., Earle, S. and Barr, P.,'Pregnancy and the maintenance of self-identity : implications for antenatal care in the community',8(4), pp. 235–241, 1995

Erlindawati, Chompikul, J. & Isaranurug, S., Factors Related To the Utilization of Antenatal Care Services Among Pregnant Women At Health Centers in Aceh Besar District, Nanggroe Aceh Darussalam Province, Indonesia ปัจจัยที่มีความสัมพันธ์กับการรับบริการฝากครรภ์ที่สถานีอนา. Journal of Public Health and Development, 6(2), pp.99–108, 2008

Faujdar R, Abhishek S.,Is antenatal care effective in improving maternal health in rural Uttar Pradesh? Evidence from a District Level Household Survey. J BiosocSci 38:433–88, 2006

Global Health Observatory (GHO), Antenatal care (at least 4 visits) [http://www.who.int/gho/ urban_health/services/ antenatal_care_text/en/]

Green, L. W., &Kreuter, M. W., 2005, *Health Program Planning, An Educational and Ecological Approach 4th Ed*, Mc. Graw Hill, Boston

Gross. K., Schellenberg,.J.A.,Kessy., F., Pfeiffer., C., Obrist .C., 'Antenatal care in practice : an exploratory study in antenatal care clinics in the Kilombero Valley :, pp. 1–11. doi: 10.1186/1471-2393-11-36, 2011

Gudmundsson S, Bjorgvinsdottir L, Molin J, Gunnarsson G, Marsal K., Socioeconomic status and perinatal outcome according to residence area in the city of Malmö. ActaObstetGynecolScand; 76: 318±23, 1997

Hajo,.I.J W,Petra T.H, Bender, Marion, B.P., HeelenT., Marlou. Paul, J.P.D.M.,'Practice variation of test procedures reportedly used in routine antenatal care in The', 78(1), pp. 27–32, 1999

Hildingsson, I,Waldenström. U., Rådestad. I,.'Women ' s expectations on antenatal care as assessed in early pregnancy : number of visits, continuity of caregiver and general content', (6), pp. 118–125, 2002

Hodgins S, D'AgostinoA.,The quality-coverage gap in antenatal care: toward better measurement of effective coverage. Global Health: Science and Practice 2(2):173–81, 2014

Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang,M., Makela, S. M., & Murray, C. J., Maternal mortality for181 countries, 1980–2008: A systematic analysis of progress towards millennium development goal 5. The Lancet, 375(9726), 1609–1623. DOI:10.1016/S0140-6736(10)60518-1, 2010

Jaddoe V., Antenatal education programs: do they work? The Lancet, 374:863-4, 2009

Kisuule, I., Kaye, D. K., Najjuka, F., Ssematimba, S. K., Aranda, A., Nakitende, G. and Otim, L. 'Timing and reasons for coming late for the first antenatal care visit by pregnant women at Mulagohospital, Kampala Uganda', pp. 1–8, 2013

Krysa, J., Iwanowicz-palus, G. J. and Bień, A. M., 'Antenatal classes as a form of preparation for parenthood : analysis of benefits of participating in prenatal education', 126(4), pp. 192–196. DOI: 10.1515/pjph-0040, 2016

Ladfors, L,Eriksson, M., Mattsson. L.A,Kyleba CK.,Magnusson.,L.Milsom., I.,'Apopulation-based study of Swedish women ' s opinions about antenatal, delivery and postpartum care', 80, pp. 130–136, 2001

Laminullah, L. & Rattu, G.D.K.A.J.M., Factors Of Associated With The Visit Antenatal Care (ANC) K4 In Community Health Center Sipatana Gorontalo. Jikmu, volume 5, pp.332–336, 2015

Langer, A., Villar, J., Romero, M., Nigenda, G., Piaggio, G., Kuchaisit, C., Rojas, G., Al-osimi, M., Belizán, J. M., Farnot, U., Al-mazrou, Y., Carroli, G., Ba, H., Lumbiganon, P. and Pinol, A,. 'BMC Women ' s Health standard and a simplified , evidence-based model of care in four developing countries',10, pp. 1–10, 2002

Lee L, Holroyd E,.Evaluating the effect of childbirth education class: a mixed-method study.IntNurs Rev, 56:361-8, 2009

Melaku, Y. A., Weldearegawi, B., Tesfay, F. H., Abera, S. F., Abraham, L., Aregay, A., Ashebir, Y., Eshetu, F., Haile, A., Lakew, Y., Kinsman, J., Article, I., Url, A., Central, P. and Central, B.,'BMC Pregnancy and Childbirth Poor linkages in maternal health care services evidence on antenatal care and institutional delivery from a community-based longitudinal study in Tigray region , Ethiopia':DOI: 10.1186/s12884-014-0418-7, 2014

Mkandawire, P., 'Gestational Age at First Antenatal Care Visit in Malawi'. pp. 2366–2374. DOI: 10.1007/s10995-015-1754-6. (July), 2015

Muyunda, B. et al., Higher Educational Attainment Associated with Optimal Antenatal Care Visits among Childbearing Women in Zambia. Frontiers in Public Health, pp.1–7.Available at:http://journal.frontiersin.org/Article/10.3389/fpubh. 2016: 00127/ abstract. 4(June) 2016

Nielsen, B. B., Liljestrand, J., and Thilsted, S. H.,'Characteristics of antenatal care attendees in a rural population in Tamil Nadu, South India : a community-based cross-sectional study', 9(6), pp. 327–333, 1995

Oakley, A., Hickey, D., Rajan, L., & Rigby, A.S,. Social support in pregnancy: Does it have long-term effects? Journal of Reproductive and Infant Psychology,14, 17–22, 1996

Ochako, R. and Gichuhi, W., 'Pregnancy wantedness,frequency, and timing of antenatal care visit among women of childbearing age in Kenya',pp. 1–9. doi: 10.1186/s12978-016-0168-2. 2016

Partridge CA, Holman JR: Effects of a reduced-visit prenatal care clinical practice guideline. J Am Board FamPract, 2005:18:555-560, 2005

Pembe, A. B., Carlstedt, A., Urassa, D. P., Lindmark, G., Nyström, L. and Darj, E,. 'Quality of antenatal care in rural Tanzania : counseling on pregnancy danger signs'. 2010

Petrou S, Kupek E, Vause S, MareshM., Clinical, provider and sociodemographic determinants of the number of antenatal visits in England and Wales. SocSci Med, 52:1123-1134, 2001

ProfilKesehatan Indonesia, KementerianKesehatanRepublik Indonesia, 2015

Reeder S.J., Martin L.L. &Koniak-Griffin D,. Maternity Nursing: Family, Newborn and Women's Health Care, 18thend. Lippincott Williams and Wilkins, Philadelphia, PA. 1997

Simoes E, Kunz S, Boeing-Schwenkglenks M, Schwoerer P, Schmahl FW., Inanspruchnahme der Schwangerenvorsorge—in Spiegel Gesellschaft LichterEntwicklungen und Aspekte der Effizienz. GeburtshFrauenheilk 63:529–537, 2003

Trujillo-Hernandez B, Rios-Silva M, Huerta M, Trujillo X, Vasquez C, Millan-Guerrero R,.The frequency of, indications for and clinical-epidemiological characteristics of first time caesarean section, compared with repeated caesarean section. Arch GynecolObstet 267:27–32, 2002

Villar J, Baaqeel H, Piaggio G et al, WHO Antenatal Care Trial Research Group WHO antenatal care randomized trial for the evaluation of a new model of routine antenatal care. Lancet 357:1551–1564. 2001

Villar J, Bergsjo P, Carroli G, Gulmezoglu M., The WHO new antenatal care model: the way forward. ActaobstetricianetGynecologicaScandinavica.,82(11):1065–6, 2003

Villar J, BergsjoP, 1997. The Scientific basis for the content of routine antenatal care I. Philosophy, recent studies, and power to eliminate or alleviate adverse maternal outcomes.ActaObstetriciaetGynecologicaScandinavica, 76(1):1-14. 1997:

WHO, UNICEF, UNFPA and the World Bank,. Trends in maternal mortality:1990 to 2010. Estimates developed by WHO, UNICEF, UNFPA andThe World Bank: 2012

WHO., The Partnership for Maternal Newborn and Child Health. Improving health, saving lives.Opportunities for Africa's newborns, practical data, policy and programmatic support for newborn care in Africa.Geneva:p. 51–62, 2006

WHO. Trends in maternal mortality: 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division. http://apps.who.int/iris/bitstream/ 10665/112682/2/9789241507226_ eng.pdf, 2013

Ye, et al., Factors affecting the utilization of antenatal care services among women in Kham District, Xiengkhouang province, Lao PDR. Nagoya journal of medical science, 72, pp.23–33, 2010

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SARARI Effectiveness to Detect Breast Cancer in Women Childbearing Age on the Village of Terungkulon, District Krian Sidoarjo East Java Indonesia

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Article Info

Keyword:

SARARI
Early Detection
Women of childbearing age
Breast Cancer

ABSTRACT

Cancer is one of the diseases, where the cells grow, change, and duplicate themselves (Putri Naura, 2009). In fact, many women of childbearing age in the village of Terungkulon, Krian district, Sidoarjo, East Java, Indonesia are unaware of the importance of breast self-examination (SARARI). The purpose of this study is to determine the effectiveness of breast self-examination (SARARI) for early detection of breast cancer in women of childbearing age in the village of Terungkulon, Krian district, Sidoarjo, East Java, Indonesia. The study is a descriptive study. The sampling technique used in the study was total sampling technique. The sample in this study was 40 respondents on June 2016 in age in the village of Terungkulon, Krian district, Sidoarjo, East Java, Indonesia in June 2016. The data were collected by using questionnaires. The data were then analyzed by editing, coding, scoring and tabulating. The results of the analysis were presented in the form of frequency distribution table. The results showed that most of the 40 respondents of childbearing women, with a total of 21 respondents (52.5%), never did breast self-check (SARARI). The breast self-examination in women of childbearing age was influenced by education, occupation, age and status. Therefore, it is necessary to give them special attention. The efforts that can be made by midwives are to provide counseling-extension on how to do breast self-check (SARARI) and to encourage women's self-awareness to do SARARI, so breast cancer incidence can be detected early on.

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1. INTRODUCTION

Many women develop breast abnormalities such as lumps, tumors, skin wrinkles, even cancer, but do not know how to detect these disorders early (Putri Naura, 2009). One example is breast cancer, which is one form of growth of "wild" and uncontrolled cells or tissues in the breast (Dra. Dini Kasdu, M. Kes 2005). In the meantime, many 30-year-old women are affected by the disease. There are even 19-year-old women who are affected by breast cancer. One can detect early signs of breast cancer with SARARI. To detect early breast abnormalities, you can actually do SARARI (breast self-examination). However, many women of childbearing age do not have an awareness of the importance of doing SARARI yet.

In Indonesia, every year there are 100 women out of 100,000 people who are affected by breast cancer. A preliminary study conducted by the Health Department of Sidoarjo Regency in 2015 showed that 170 people suffered from breast cancer. From the informal interviews conducted with 10 women of reproductive age (15-30 years), 6 of them said that they did not have any desire to do breast

self-examination (SARARI). Meanwhile, the other 4 women of childbearing age said that they tried to do breast self-check for early detection of breast cancer. From the data obtained, it can be seen that there is an increased tendency of the incidence rate of breast cancer. Breast cancer is one of the diseases that can be caused by heredity. However, it is also uncertain whether there are other factors that cause it, such as eating too much fatty foods and consuming drugs containing estrogen hormones and carcinogens (synthetic dyes and chemicals). Breast cancer is originally developed due to damage in the DNA from a single cell. When genes that normally limit cell growth and division are damaged, the cells can divide and multiply. These cells can break away and move to distant parts of the body in a process called metastasis. These days, many people think that breast cancer is only suffered by women of 50 years and over. This is because many women of childbearing age are not aware of the importance of SARARI. If the disease can be detected early, then it can be treated immediately. The objective of the study is to know the effectiveness of SARARI for early detection of breast cancer in Terungkulon Village, Krian District, Sidoarjo.

2. RESEARCH METHODS

The study is a descriptive study. The population of the study was all women of childbearing age in RT 06/ RW 01 Terungkulon Village, Krian District, Sidoarjo with a total of 40 respondents. The sampling technique used in this study was total sampling technique, a sampling method by taking all members of the population to be the sample.

3. RESULT AND ANALYSIS

1. Education Level

No.	Education Level	Number	%
1. 2. 3.	Primary School Junior High School Senior High School	20 15 5	50 37,5 12,5
	Total	40	100

The educational research data showed that half of the respondents (50%) had primary school background with a total of 20 respondents. According to Suwarno (1992), cited by Nursalam and Siti Pariani (2001), education means the guidance that a person gives towards the development of others toward a particular goal. The higher the level of one's education, the easier it will be for them to receive information.

2. Level of Work

No.	Level of Work	Number	%
1. 2. 3.	Housewife Government Employees Private Employees	23 7 10	57,5 17,5 25
	Total	40	100

From the employment data, it was found that most (57.5%) were housewives. Housewives had more free time to obtain information by reading books, magazines, mass media or information from television, compared to public or private employees who had less time to look up information since they needed to focus on their work, so it was more likely for them to ignore the information. This is in line with the theory by Markum (1991), as cited by (Nursalam, 2001), that people work towards the development of others toward a particular goal. The higher the level of one's education is, the easier it will be for him/ her to receive information.

3. Age

No.	Age	Number	%
1. 2. 3.	15-20 year 20-25 year 25-30 year	20 13 7	50 32,5 17,5
	Total	40	100

The respondents' age data showed that half (50%) of the respondents were 15-20 years old, with a total of 20 respondents. According Purwanto Ngalim (2007), the older someone is, the higher the level of maturity will be in terms of thinking and working.

4. Motivation

No.	Motivation	Number	%
1. 2. 3.	Low Moderate High	21 11 8	52,5 27,5 20
	Total	40	100

The data showed that most respondents (52.5%) had low motivation with a total of 21 respondents, and 27.5% of them had moderate motivation with a total of 11 respondents. A small portion (20%) of the respondents had high motivation with a total of 8 respondents. Motivation itself is a driver/ an effort that triggers one's behavior so that he/ she is driven to act to do something to achieve a certain result or goal (Purwanto Ngalim, 2007).

4. CONCLUSION

Most of the respondents (50%) were 15-20 years, with a total of 20 respondents. Half of the respondents (50%) had primary school background with a total of 20 respondents. Most of the respondents' occupation (57,5%) was housewife with a total of 23 respondents. Most of the respondents (52.5%) had low motivation, with a total of 21 respondents. Motivation in women of childbearing age in breast self-examination is influenced by education, occupation, age and status. Therefore, it is necessary to get them special attention. Efforts that can be done by midwives are to provide counseling on how to do breast self-examination (SARARI) and to encourage women's self-awareness to perform SARARI, so that breast cancer incidence can be detected early on.

ACKNOWLEDGEMENTS

I would like to thank the chairman of High School of Health Sciences of Dian Husada Mojokerto for their support in this research.

REFERENCES

Alimul, A (2003). Riset Keperawatan dan Tehnik Penulisan Ilmiah. Jakarta: Salemba Medika.

Arikunto, S (2006). Prosedur Penelitian Suatu Pendekatan Praktik Edisi Revisi. Jakarta: Rineka Cipta.

Azwar, Saifudin, 2009. Metode Penelitian. Yogyakarta : Ristaka Pelajar

Brunner and Suddarth (2002). Buku Ajar Keperawatan Medikal Bedah. Jakarta: EGC.

Dalimarta, S (2004). Deteksi Dini Kanker dan Simplisia Anti Kanker. Jakarta: Penebar Swadaya.

Depdikbud. 2005. Kamus Besar Bahasa Indonesia. Jakarta : Balai Pustaka

Kasdu, Dini (2005). Solusi Problem Wanita Dewasa. Jakarta: Puspa Swara

Manuaba, Ida Bagus Gedhe (1999). Memahami Kesehatan Reproduksi Wanita. Jakarta: Arcan

Notoatmodjo. 2002. Metodologi Penelitian Kesehatan. Jakarta : Rineka cipta

Nursalam (2003). Konsep dan Penerapan Metodologi Penelitian Ilmu Keperawatan. Jakarta: Salemba Medika

Nursalam, Pariani, S. 2001. Pendekatan Praktik Metodologi Riset Keperawatan. Jakarta : CV. Info Medika

Putri Naura (2009). Deteksi Dini Kanker Payudara. Jogjakarta: Aura Jogja

Siagian, Sondang (2004). Teori Motivasi dan Aplikasinya. Jakarta: PT Asdi Mahasatya

Widayatun, Tri Rusmi (1999). Ilmu Perilaku. Jakarta: Sagung Seto

Wasis, 2008. Pedoman Riset Praktis Untuk Profesi Perawat. Buku Kedokteran : EGC

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The Impact of Avocado (*Persea Americana Mill*) Leaf Decoction to Reduce Systolic and Diastolic Blood Pressure Among Hypertension Patients in Mojokerto, East Java - Indonesia

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Article Info

Keyword:

Stew Leaves Avocado,
Blood Pressure,
Hypertension.

ABSTRACT

Hypertension is a disease that is not curable but can only be controlled. Pharmacological treatment is considered expensive by many people. In addition, non-pharmacological treatments also have no harmful side effects, unlike pharmacological treatments. One example of non-pharmacological treatments for hypertension is herbal therapy by consuming 200 ml of avocado leaf decoction. This study aims to determine the effects of avocado (*Persea Americana Mill*) leaf decoction against systolic and diastolic blood pressure in patients with hypertension in Mojokerto district, East Java, Indonesia. The study used quasi experimental design with pre- and post-test control group design. The population in this study was all patients with hypertension in Jolotundo Village, Jetis Sub-District, Mojokerto Regency. A total of 32 people were taken as a sample through random sampling technique. The independent variable was avocado leaf decoction therapy, while the dependent variable was blood pressure. The observation was analyzed by using T-Test performed with SPSS 17.0. The results showed that prior therapy avocado leaf decoction, the difference in mean value of systolic blood pressure (SBP) was 20.67 mmHg and the mean difference in diastolic blood pressure (DBP) was 10.67 mmHg. The mean difference in the control group before being given a decoction of the leaves of avocado was 16.67 mmHg, whereas in the post test control group, the mean difference was 6 mmHg. Based on T-Test of MAP, the experiment group obtained a T-count of -10.827 with a significance value of 0.000 <α:0.05 and MAP control group changed with a T-count of -9.353 and a significance value of 0.000 <α: 0.05. It is advised for health personnel to improve their service in the community, especially for people who have hypertension by doing counseling about non-pharmacological treatment for lowering blood pressure in hypertensive patients.

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1. INTRODUCTION

Hypertension is one of the many public health problems in Indonesia. Hypertension is a disease that cannot be cured but can only be controlled. Pharmacological treatment is considered expensive by the community. In addition, pharmacological treatment also has side effects. Those reasons are the cause for decreasing public purchasing power and, as a result, they cannot take the medication regularly. Non-pharmacological treatment is necessary because it is very easy to practice and does not cost too much. Additionally, non-pharmacological treatment also has no harmful side effects, unlike pharmacologic treatments. One of non-pharmacological medications used to treat hypertension is herbal therapy with a 200 ml of avocado leaf decoction every day regularly to lower blood pressure (Azizahwati, 2011). However, some people have not realized the benefits of avocado leaf stew (200 ml) in decreasing blood pressure.

Hypertension is one of the most dominant global health problems in the world in both developed and developing countries. Based on data from epidemiological studies of the World Health Organization that has conducted research in several countries, it is found that hypertension has attacked 26.4% of the population in the world (WHO, 2013). In Indonesia, based on reports of basic health research results, the prevalence of hypertension, based on interviews (whether ever in the diagnosis of health workers or taking hypertensive medication) increased from 7.6% in 2007 to 9.5% in 2013 (Riskesdas, 2013). Based on the data, the total number of hypertensive patients in East Java was as many as 125,173 patients. On October 20, 2016, the data were taken from Jolotundo Village,Jetis Sub-District, Mojokerto Regency, from January to September 2015 (Dinas Kesehatan Jawa Timur, 2012). The number of primary hypertensive patients was 108 people from a total of 1226 residents. It is estimated that approximately 8.9% of the total patients were hypertensive patients in the region. It is also found that only 32 patients with hypertension or about 32.4% of the patients routinely checked their disease (Data Ponkesdas, 2015). Azizahwatiin his research found the results of his research proves that flavonoid compounds in avocado leaves play a role in overcoming hypertension (Azizahwati, 2011). It is revealed that avocado leaves can lower blood pressure by decreasing the systole blood pressure for 85.7%, and diastole for 85.7% (Nurfaridah, 2014).

Many factors are suspected as the cause of hypertension. Some of the causes can be classified to be the cause of primary hypertensive disease, such as age, psychological stress, heredity, diet and overweight or obesity. It has been said before that hypertension is a disease that cannot be cured but can only be controlled, so that people with hypertension always try to find an effective treatment to lower their blood pressure. If it lasts for a long time, there will be a subsequent heart failure with short breath. A more serious consequence is the occurrence of stroke and death due to blood pressure which is not smooth, so that the supply of oxygen under the red blood cells is too late (Gunawan, 2009). Most (90%) cases of hypertension are primary hypertension with an unknown cause. As a result, not all hypertensive patients need anti-hypertensive drugs. The treatment that needs to be done is eliminating risk factors that are suspected to be associated with the incidence of hypertension. This is due to lack of proper hypertension treatment (Gunawan, 2009). In addition, pharmacological treatment is increasingly expensive. There are also non-pharmacological treatments, for example by using herbal therapy with a 200 ml of avocado leaf decoction every day regularly to lower blood pressure (Azizahwati, 2011). It is because it contains nutritious flavonoids, such as diuretics that work by releasing a number of liquids and electrolytes as well as substances that are toxic. By decreasing the amount of water and salt in the body, the blood vessels will be loose, so that the blood pressure slowly decreases (Utami, 2008).

One of the non-pharmacological treatments in curing hypertension disease is by herbal therapy by consuming 200 ml of avocado leaves decoction everyday to lower blood pressure. However, some people have not realized the benefits of avocado leaf stew to decrease in blood pressure since this discovery has not been widely known. Thus, it is necessary to conduct Health education, demonstration and provide nursing care for hypertensive patients and recommend them to consume avocado stew as a modification of non-pharmacological therapy in addition to pharmacological therapy which is considered expensive by most peopleas well as having side effects.

2. RESEARCH METHOD

The design used in this research is Quasi-experiment with pre- and post-test control group design. The population of the research was all hypertensive patients in Jolotundo Village, Jetis Sub-District, Mojokerto Regency. The instrument used in collecting the dependent variable data on blood pressure drop was observation sheet, measuring instrument which was sphygmomanometer, and calibrated stethoscope. On the other hand, the instrument used to collect the independent variable data was SAK (unit event activities). The samples of the research were 30 hypertensive patients. The sampling technique of this research was random sampling which is a way of sampling the population members randomly without considering the strata (level) of the members.

3. RESULTS AND ANALYSIS

Effects of avocado decoction to decrease systolic and diastolic blood pressure in hypertensive patients

Table 1. Distribution of frequency of respondents based on decrease in blood pressure from the pre- and post-examination in treatment and control groups in Jolotundo Village, Jetis Sub-District, Mojokerto Regency

	Blood Pressure Changes from the Pre- and Post-Test					
	Treatment group			Control group		
	SBP	DBP	MAP	SBP	DBP	MAP
Mean	-20.67	-10.67	-14.89	-16.67	-6.00	-9.55
Maximum value	30	20	-7	30	10	-3
Minimum value	10	0	-27	10	0	-17
Standard deviation	7.037	4.577	5.326	6.172	5.071	3.956
N	15			15		

Table 1shows that in the Pre-Post Test experimental group, there was a change of20.67 mmHg in the mean rate of systolic blood pressure change (SBP) with a maximum and minimum value of 30 mmHg and 10 mmHg. The mean change in diastolic blood pressure (DBP) was 10.67 mmHg with a maximum and minimum value of 20 mmHg and 0 mmHg. On the other hand, the mean change of Mean Arteria Pressure (MAP) was -14.89 mmHg. Meanwhile, in the control group, the mean value of systolic blood pressure change (SBP) in the Pre-Post Test was 16.67 mmHg with a maximum and minimum value of 30 mmHg and 10 mmHg. The mean change of diastolic blood pressure (DBP) was 6.00 mmHg with a maximum and minimum value of 10 mmHg and 0 mmHg and the mean change of Mean Arteria Pressure (MAP) was -9.55 mmHg.

Based on the T-test result of MAP change in the experiment group, the obtained value of t arithmetic was -10.827 with significant 0.000 <α: 0.05 and t arithmetic value of MAP change in the control group was -9.353 0.000 <α: 0.05.

Avocado leaf stew had an effect of decreasing systolic and diastolic blood pressure in hypertensive patients compared to those in the control group in Jolotundo Village, Jetis Sub-District, Mojokerto Regency.

Table 1 shows that in the Pre-Post Test experimental group, the mean change of systolic blood pressure (SBP) was 20.67 mmHg with a maximum and minimum value of 30 mmHg and 10 mmHg. The mean change in diastolic blood pressure (DBP) was 10.67 mmHg with a maximum and minimum value of 20 mmHg and 0 mmHg. The mean change in Mean Arteria Pressure (MAP) was -14.89 mmHg. On the other hand, in the control group, the mean value of systole blood pressure change (SBP) obtained from the Pre-Post Test was 16.67 mmHg with a maximum and minimum value of 30 mmHg and 10 mmHg. The mean change of diastolic blood pressure (DBP) was 6.00 mmHg with a maximum and minimum value of 10 mmHg and 0 mmHg. The mean change of Mean Arteria Pressure (MAP) was -9.55 mmHg. Based on T-Test result of MAP change for the experiment group, the t count arithmetic value obtained was -10.827 with significant 0.000 <α: 0.05. Besides, the mean change of MAP of the control group had a t value of -9.353 0.000 <α: 0.05

One of avocado plants parts that have many benefits is the leaves. Research by experts suggests that avocado leaves have antifungal, antihypertensive, antimicrobial, cardio protective, anti hipper lipidemia, hepato protector, anticonvulsant, hypoglycemic, vaso relaxant, and analgesic and anti-inflammatory effects (Ojewolw, 2007). Glycosides in avocado leaves are reported to have lowered blood pressure activity (Depkes, 2013).The result of a study proved that avocado leaves have an effect in blood pressure decrease of 58 mmHg in male mice and 54.5 mmHg in female mice with a therapy dose of 40 mg / kgBB (Azizahwati, 2011). One way of how avocado leaf works is by reducing the amount of fluids, electrolytes and substances that are toxic. With the reduced amount of water and salt in the body, the blood vessels will be loose so that blood pressure slowly decreases.

From the description, the decoction of leaves of avocado (Persea Americana Mill) has many useful benefits for one's health. One of which is to lower blood pressure if consumed regularly and according to advice. Thus, it can be concluded from the results of the research and explanation above

that decoction of leaves of avocado (Persea Americana Mill) affects the acceleration of decrease in systolic and diastolic blood pressure in hypertensive patients in Jolotundo Village, Jetis Sub-District, Mojokerto Regency.

4. CONCLUSION

Before being given avocado leaf stew, the mean difference of systolic blood pressure (SBP) value in the experimental group was 20.67 mmHg and the mean difference of diastolic blood pressure (DBP) was 10.67 mmHg. The Mean Arteria Pressure (MAP) change was -14.89 mmHg. The average value in the control group before the avocado leaves decoctions were given for systole blood pressure (SBP) was 16.67 mmHg. Meanwhile, in the post control group, the mean difference of diastolic blood pressure (DBP) was 6 mmHg. The Mean Arteria Pressure (MAP) change was -9.55 mmHg. Based on T-Test of MAP experiment group, the change obtained for t-count was -10.827 with a significance value of 0.000 <α: 0.05 and MAP control group changed with t-count of -9.353 0.000 <α: 0.05. The decoction of avocado leaves had an effect to decrease systolic and diastolic blood pressure in hypertensive patients in Jolotundo Village ,Jetis Sub-District, Mojokerto Regency.

ACKNOWLEDGEMENTS

I would like to thank the Director of Nursing Academy Dian Husada for the fund support for this research.

REFERENCES

Azizahwati., Hanani, E,. & Hernasari. 2011. Jurnal Bahan Alam. *Efek anti hiper lipidemia ekstrak etanol daun alpukat (Persea Americana Mill) pada tikus putih jantan yang diberi diit tinggi kolesterol dan lemak,* 7: 321- 32.

Data Ponkesdes Jolotundo Kecamatan Jetis Kabupaten Mojokerto periode Januari-September tahun 2015

Dinas Kesehatan Jawa Timur. 2012. *Profil Kesehatan Jawa Timur 2012*. www.depkes.go.id/resources/...2012/15_Profil_Kes.Prov.JawaTimur_2012.pdf

Gunawan, Lany. 2009. *Hipertensi TekananDarah*. Yogyakarta: Penerbit Kanisius

Nurfaridah, V. 2014. Jurnal Bahan Alam Indonesia. *Rebusan Daun Alpukat (Persea Americana Mill) Dapat Menurunkan Tekanan Darah Sistole dan Diastole Pada Penderita Hipertensi Usia 15-49 Tahun.*Vol.01, No.XVII, maret 2014.

Ojewole, Jao. Kamadyaapa, Mm Gondwe, K Moodley, dan Ct Musabayane.2007. *Cardiovascular effects of Persea Americana Mill (Lauraceae)(avocado) aqueous seaf extract in experimental animals*.Cardiovascular Journal of South AfricaVol18,no.2, March/April 2007. PP: 69-76.

Riskesdas. 2013. www.depkes.go.id/resources/download/general/Hasil%20Riskesdas%202013.pdf

Utami,Indah W. 2008. Pengaruh Pemberian Ekstrak Etanol Daun Alpukat (*PerseaAmericanaMill*) Terhadap Aktivitas Diuretik Tikus Putih Jantan Sprague- Dawley. Skripsi Fakultas Kedokteran Hewan Institut Pertanian Bogor.

WHO. Raised Blood Pressure. 2013. http://www.int/gho/nccd/ris_factors/blood_pressure_prevalence_text/en/index.html [www.depkes.go.id/2013

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The Occurrence of Measles Disease Among Children Based on Geographic Information System in Pesisir Selatan District

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Article Info

Keyword:

Behaviour,
Density,
GIS,
Immunization,
Income,
Knowledge
Measles,
Nutrition.

ABSTRACT

Morbilli disease is one of the death causes among children around the world. It is one of the airborne infectious diseases which are caused by paramyxovirus. In 2013, there were 74 cases of measles in Pesisir Selatan with IR = 1.67 per 10,000 inhabitants accompanied by 2 times outbreaks. The objective of this study is to know the risk factors that play a role in the incidence of measles and its spread in Pesisir Selatan District. The case control study was conducted from 34 cases of children under ten years old suffering from measles disease which taken with simple random sampling and 34 controls with purposive random sampling. The data were tested by using chi square test and Mc Nemar with a 95% confidence degree (α = 0.05). The spatial analysis used Epi Info software. More than half of the children were immunized against Measles (61.8%), had normal nutritional status (76.5%), had high knowledge mother (55.9%), had a positive attitude (61.8%), living with high income families (54.4%), and living in densely populated rooms (64.8%). Chi Square test showed the related factors with measles incidence (p value <0.05). They were immunization status, maternal knowledge level, mother attitude, family income level, and density of room occupancy. Spatial analysis showed the most of measles disease distribution was found in Linggo Sari Baganti sub-district there were 21 peoples from 4 districts affected by Measles. It is expected that health workers in Pesisir Selatan District can increase health education and health promotion about Measles Disease and immunization programs to reduce the risk of measles disease,especially in Linggo Sari Baganti sub-district.

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1. INTRODUCTION

Measles (Morbilli) is one of the really contagious infectious diseases caused by paramyxovirus whose symptoms are characterized with high fever, inflammation of the eyes (red eyes), and reddish spots on the skin. Measles is one of the diseases that often attack 10-year-old-children and even adults. The disease can be transmitted through splashes from the mouth, nose, or throat of the patient. Measles is one of the main causes of high rate of morbidity and mortality in infants and children (Departemen Kesehatan RI, 2016)

Measles is still common in many developing countries, particularly in parts of Africa and Asia. An estimated of 20.4 million people were affected by measles in 2016. The overwhelming majority (more than 95%) of measles deaths occur in countries with low per capita incomes and weak health infrastructures. Indonesia is a developing country whose measles incidence is quite high. Health profile data of Indonesia in 2010 reported that Measles Incidence rate (IR) in Indonesia was 0.73 per 10,000

people. Case Fatality Rate (CFR) of measles had its outbreak in 2010, i. e. 0.233. Measles cases spread throughout the regions in Indonesia. Based on West Sumatera Health Office data in 2010, the incidence rate of measles in West Sumatera was 8.7 per 10,000 people (Departemen Kesehatan RI, 2008; WHO, 2018; Dinas Kesehatan Provinsi Sumatera Barat, 2011).

The number of measles cases in Pesisir Selatan District has decreased since the last 4 years from 83 cases with IR = 1.85 per 10,000 population in 2010, 57 cases (IR = 1.33) in 2011, 52 cases (IR = 1.20) to 45 cases with IR = 1.02 in 2012. Nevertheless, there was a sharp increase in the number of cases in 2013, i. e. 74 cases with IR = 1.67 per 10,000 population accompanied by 2 time Outbreaks. Based on Health Office's annual report in Pesisir Selatan District in 2013, the highest number of measles cases in Pesisir Selatan was on children under 10 years old (Dinas Kesehatan Kabupaten Pesisir Selatan, 2012).

Spatial analysis is used to facilitate the measles disease mapping in Pesisir Selatan and to know its distribution. Based on the magnitude of the problems which is described above, the researcher is interested to conduct a research on spatial analysis of measles disease risk factors of children in Pesisir Selatan District.

2. RESEARCH METHOD

This research is an analytic research using case control design which was supported by spatial analysis. The case group in this research consisted of Measles patients, while group control consisted of non- measles patients. The group control was selected by using matching technique with case comparison of 1: 1. The matching aspects in this study included gender, age and, mutual living area. The place of study was Pesisir Selatan District. Based on the results of the sample calculation, there were 68 people who were divided into 2 groups, 34 people in the case group and 34 people in the control group. The case inclusion criteria were children aged 10 who had measles in the Pesisir Selatan district and were willing to participate in the study. Meanwhile, the exclusion criteria were respondents who were not in the study site and were severely ill. The research data was analyzed by using Epi info 7 software.

3. RESULTS AND ANALYSIS

Table 1 shows that the percentage of children who were never immunized in the case group was 55.9%. The abnormal malnourished children in the case group were 29.4% and in the control group were 17.6%. The percentage of mothers with low knowledge in the case group was 76.5%, In group cases, there was a total of 67.7% of children who had negative attitudes, and the percentage of children from low-income families in the case group was73.5%. On the other hand, the percentage of children living in densely-populated rooms in case group was 88.2%.

Table 1. Distribution Frequency of Respondent

Independent Variable	Status				Total	
	Cases		Control			
	f	%	f	%	f	%
Immunization status						
Never	19	55.9	7	20.6	26	38.2
Ever	15	44.1	27	79.4	42	61.8
Total	34	100	34	100	68	100
nutritional status						
abnormal	10	29.4	6	17.6	16	23.5
Normal	24	70.6	28	82.4	52	76.5
Total	34	100	34	100	68	100
knowledge of mother						
low	26	76.5	4	11.8	30	44.1
High	8	23.5	30	88.2	34	55.9
Total	34	100	34	100	68	100
Attitude						
Negative	23	67.7	3	8.8	26	38.2
Positive	11	22.3	31	91.2	44	61.8
Total	34	100	34	100	68	100
Income						
Low	25	73.5	6	17.6	31	45.6
High	9	26.5	28	82.4	37	54.4
Total	34	100	34	100	68	100
dwelling density						
Solid	30	88.2	14	41.1	44	64.8
Not Solid	4	11.8	20	58.9	24	35.2
Total	34	100	34	100	68	100

Spatially, the spread of measles cases in Pesisir Selatan district can be seen in Figure 1. Based on the picture, it can be seen that the majority of the measles incidence happened in Linggo Sari Baganti sub-district with21 people. The number of cases in Koto IX Tarusan was 7 cases, in IV Jurai sub-district was 4 cases, and in Ranah Pesisir was 1 case.

Figure 1. Measles cases distribution of children in Pesisir Selatan District.

Description: **1 Respondent**

More than 1 respondent

Table 2. The Relationship Between Risk Factors and the Occurrence of Children Measles Disease

Variables	OR	95% CI		P value
		Lower	Upper	
Immunization status	5.00	1.44	17.27	0.004*
Nutritional status	0.66	0.61	4.59	0.332
Knowledge of mother	23.00	3.106	170.315	0.001*
Attitude	43.00	2.605	709.886	0.001*
Income	20.00	2.648	149.208	0.001*
Dwelling density	9.00	2.088	38.788	0.001*

Based on Table 2, there were some factors related to the incidence of measles disease in children. They were immunization status with OR = 5.00 (95% CI = 1.44-12.77), maternal knowledge level with OR = 23.00 (95% CI = 3.106-170.315), mother attitude with OR = 43.00 (95 % CI = 2.605-709.886), family income level with OR = 20.00 (95% CI = 2,648-149,208), room occupancy density with OR = 9.00 (95% CI = 2.088-38.788). Meanwhile, the unrelated factor to measles incidence in children was nutritional status with OR = 1.66 (95% CI = 0.61-4.59).

Those who had never been immunized tended to be 5 times more risk to get measles disease than those who had been immunized from measles. The relationship was significant with p = 0.04 (95% CI = 1.44-12.77). From the test result there were 15 pairs (57.69%) of cases who had never been immunized as well as control immunized against Measles, and 3 pairs (37.50%) of cases had been immunized but never immunized to fight measles. Measles immunization during infancy can reduce transmission of measles virus and reduce the chances of vulnerability to be exposed to the virus (Suardiyasa Made, 2008).

Based on the results of the study, nutritional status was not a risk factor for measles incidence. The relationship was not significant with p = 1.66 (95% CI = 0.61-4.59). From the test result there were 10pairs of cases (35.71%) with abnormal nutritional status and normal nutritional control, 6 pairs (100%) cases with normal nutritional status and control with abnormal nutritional status. A person with good nutritional status will have good body resistance to an illness as well as a rapid healing process (Purnomo, 1996)

Those with low maternal knowledge were 23 times more at risk to get measles compared to those with mothers whose knowledge level is high. The relationship is significant with p = 0,001 (95% CI = 3,106-170,315). From the test result there were 23 pair (76.67%) cases of children with low maternal knowledge and control of children with high maternal knowledge, 1 pair (25%) case of children with high maternal knowledge and control of children with low maternal knowledge. The level of knowledge greatly affects how a person acts and seeks causes and finds solutions in his/her lives (Surtayana, 2002).

Those with negative mothers' attitudes were 43 times more at risk to get measles compared to those with positive attitudes. The relationship was significant with p = 0.001 (95% CI = 2.605-709.886). From the test result, there were 21 pairs (65.63%) cases of children with negative mother attitude and control of children with positive mother attitude, 1 case had positive attitude and negative control. Attitude affects a person in behaving and plays an important role in determining behavior (Notoadmojo, 2005)

Those from low-income family were 20 times more at risk to measles compared to those from high-income family. The relationship was significant with p = 0.001 (95% CI = 2,648-149,208). From the test result, there were 20 pairs of children (71.43%)in group cases from low-income family and 20 pairs from high-income family, 1 pair (16.67%) case of children from high-income family and control of children low-income family. Adequate family income will support the development of children, because parents can provide all the needs for the children, both primary and secondary needs (Wulandari, 2009).

Those occupying dense rooms were 9 times more at risk to get measles compared to those occupying rooms which were not dense. It had a significant relationship with p = 0,001 (95% CI = 2,088-38,788). From the test result, there were 18 pairs of (90%) cases of children sleeping in densely populated rooms and 18 controls of children who slept in not densely populated rooms, 2 pairs (14.29%) cases of children sleeping in rooms which were not densely occupied and control children who slept in a crowded room. A dense population is a fertile breeding ground for viruses. Compact dwelling can facilitate airborne transmission (Achmadi, 2008).

4. CONCLUSION

The risk factors for measles disease incidence in children in Pesisir Selatan District were immunization status, mother's knowledge level, mother's attitude, family income level, and room occupancy density. On the other hand, the nutritional status was not a risk factor that played a role in the incidence of measles.

It is suggested that Pesisir Selatan District Health Office cooperate with all work sectors to improve health promotion activities and health counseling about measles and its immunization program, so the incidence of measles in Pesisir Selatan district can be suppressed.

ACKNOWLEDGEMENTS

Acknowledgments are conveyed to the Dean of the Faculty of Public Health of Andalas University, to Pesisir Selatan District Health Office and to people who have provided assistance in conducting this research.

REFERENCES

Achmadi U. F. Manajemen Penyakit Berbasis Wilayah, Seri Desentralisasi Kesehatan Masyarakat. Jakarta; UI Press; 2008

Departemen Kesehatan RI. Informasi Pengendalian Penyakit dan Penyehatan Lingkungan. Jakarta: Ditjen PP&PL;2008

Departemen Kesehatan RI. Waspada Penyakit Campak. Jakarta: Departemen Kesehatan RI; 2016

Dinas Kesehatan Provinsi Sumatera Barat. Laporan Tahunan Dinas Kesehatan Provinsi Sumatera Barat Tahun 2011. Padang: Dinas Kesehatan Provinsi Sumatera Barat;2011

Notoadmojo. Promosi Kesehatan Teori dan Aplikasinya. Rineka Cipta, Jakarta; 2005

Purnomo. Faktor-faktor yang Berhubungan dengan terhadap Kejadian Penyakit Campak pada Anak Usia 12-24 bulan di Kodya Jaksel Tahun 1996. Jakarta: Program Studi Ilmu Kesehatan Masyarakat . Program Pascasarjana UI;1996

Seksi Surveilans & Penanggulanag Bencana KLB/Wabah. Laporan Tahunan Penyelidian KLB Campak. Pesisir Selatan: Dinas Kesehatan Kabupaten Pesisir Selatan; 2012.

Suardiyasa Made. Faktor-faktor Risiko Kejadian Penyakit Campak pada Anak balita di Kabupten Tolitoli Provinsi Sulawesi Tengah. Yogyakarta: Universitas Gajah Mada Yogyakarta; 2008.

Surtayana. Hubungan Kesehatan Lingkungan Fisik Rumah da Karakteristik Balita dengan Kejadian Penyakit campak pada Anak Balita di kabupaten Garut Tahun 2000-2001. Jakarta: Program Ilmu Kesehatan Masyarakat, Pascasarjana UI;2002

WHO. World Health Statistic (http://www.who.int/csr/don/2011_04_21/en/) Diakses 20 maret 2018.

Wulandari AP. Hubungan Antara Faktor Lingkungan Dan Factor Sosiodemografi Dengan Kejadian Diare Pada Balita Di Desa Blimbing Kecamatan Sambirejo Kabupaten Sragen 2009

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The Successfulness of Exclusive Breastfeeding for Working Mothers in the Formal Sector

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Article Info

Keyword:

Exclusive breastfeeding,
Working mother,
Formal sector,
Supporting factors,
Barrier factors.

ABSTRACT

Failure to achieve exclusive breastfeeding in Indonesia is caused by many things. One of them is the increasing number of female workers. Working mothers are more at risk for not breastfeeding exclusively. This study aimed to obtain in-depth information about the behavior of breastfeeding, supporting and barrier factors in the exclusive breastfeeding in mothers who work in the formal sector. The type of the research is qualitative descriptive research with Rapid Assessment Procedure. The sampling technique was used purposive sampling in breastfeeding mothers working in formal sector such as government office and private office in Pekanbaru city. The data was collected through in-depth interviews and observations from 8 informants and 3 key informants. Results showed that the success of exclusive breastfeeding began in during pregnancy, while in hospital, her time off work and her time at work. Barrier factors are the situation and condition of employment which do not allow exclusive breastfeeding. Some mothers could not pump breast milk, and there were no available means to breastfeed or pump breast milk. Mothers with confidence had a greater chance to succeed in exclusive breastfeeding. Support from leaders, husbands, families and co-workers are needed to encourage and motivate exclusive breastfeeding.

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1. INTRODUCTION

Scaling up Nutrition Movement is a government program in public nutrition improvement. The First 1000 Day of Life is an important period in infant growth and development (Bappenas, 2012). Exclusive breastfeeding is the best food for infants aged 0-6 months. Government Regulation No. 33 of 2012 on exclusive breastfeeding stipulates exclusive breastfeeding for infants since they are born until they are six months old and it is recommended to continue it until they are two years old with an appropriate supplementary feeding (Indonesia R, 2012). The Basic Health Research Report of Indonesia (Riskesdas) shows that there is an increase of exclusive breastfeeding from 32% (Riskesdas 2007) to 42% (Riskesdas 2013) (Riskesdas, 2007; Riskesdas, 2013). Although there is an increase of 2% per year, the figure does not reach the target of 80% (BPS, 2012).

Exclusive breastfeeding target is not achieved in Indonesia due to several factors, including increased female participation in work and media influence in promoting infant formula. Central Bureau of Statistics reported the number of workers in Indonesia in 2012 increased by 0.85%, from 118 million people to 117.4 million in 2011 (BPS, 2012).The number of male workers is around 62% and the number of female workers is around 38%. The percentage of female workers in the formal sector is 35% (ILO, 2013). Studies have shown that working mothers are more at risk of exclusive breastfeeding than non-working mothers (Mitra, 2010; Amin, 2011). Basrowi's research shows that 32.3% of formal sector workers can provide exclusive breastfeeding, 45% of formal sector women workers ceases exclusive

breastfeeding before the babies are 4 months old. The length of work leave of less than three months is one of the factors causing non-exclusive breastfeeding (Basrowi, 2012).

These studies are quantitative studies that show the magnitude of problems and factors related to exclusive breastfeeding. However, the number of qualitative studies that reveal the problems of exclusive breastfeeding behavior in working mothers is very limited. The solution given to working mothers is to implement lactation management when they are pregnant, both on leave of work and while working. But there are still many mothers who do not know about lactation management at work. The purpose of this study was to obtain in-depth information about breastfeeding behavior and the supporting factors and barriers to exclusive breastfeeding in working mothers in formal sector.

2. RESEARCH METHOD

The research is qualitative research with Rapid Assessment Procedure (RAP) approach. RAP is a qualitative data collection technique for practical purposes such as obtaining rapid qualitative information useful for decision making(Scrimshaw, 1992). This research was conducted in Pekanbaru City, Riau Province in December 2014. The selection of respondents was done by using purposive sampling technique with the following criteria; breastfeeding mother working in formal sector, either in government office or private office who has a baby with a birth weight of > 2500 grams who is not a twin. The respondents were 8 breastfeeding mothers and 3 key informants (1 boss and 2 co-workers). There were no additional informants during the study.

The data collection techniques were in-depth interviews and observation on breastfeeding mothers as well as their co-workers and boss. Before interviewing the informants, the researcher confirmed their willingness to participate in the research by asking them to sign informed consent. The data processing and analysis were done through the following stages: (1) making the interview transcript, (2) compiling the in-depth interview data, (2) making the matrix, (3) interpreting the data according to findings, and (4) making conclusions (Martha, 2016). The validity of data was tested by using triangulation with the following process: (1) Triangulation of source by checking data through some sources, i. e. main informant and key informant. (2) Triangulation of methods by checking data through multiple methods, i. e. observations and in-depth interviews. When testing the data validity and the two techniques produced different data, the researcher conducted further discussions to relevant data source or other sources, to ensure the correctness of the data, (3) Triangulation of data by taking the data from more than one person and getting feedback from the informants (Martha, 2016).

3. RESULTS AND ANALYSIS

3.1. Characteristic of Informants

The age range of the informants: 27-32 years old. The informants' education ranged from Diploma III, Bachelor to Master. The informants' occupations were grouped into two areas: health and non-health. It took them an average of 20 minutes to travel from home to work by motor vehicle. The average length of work per day was 8-10 hours per day. The characteristics of the informants can be seen in Table 1.

Table 1. Characteristics of informants

Characteristics of Informants Code	Age (Year)	Breastfeeding status	Travel time to work place	Type of work	Education	Parity	Age of children (Month)	Birth weight (gram)	Sex (children)	Delivery
INF1	28	Exclusive breastfeeding	30 minutes	Lecturer	Master's degree in Public Health	1	8	3200	F	Normal
INF2	29	Exclusive breastfeeding	20 minutes	Government employee	Bachelor's degree in Public Health	1	12	3000	F	Normal
INF3	29	Non-exclusive Breastfeeding	10 minutes	Lecturer	Master's degree in Public Health	2	6	2600	F	Normal
INF4	27	Non-exclusive Breastfeeding	30 minutes	Bank employee	Bachelor's degree in Economy	1	10	3600	F	Normal
INF5	32	Non-exclusive Breastfeeding	20 minutes	Government employee	Bachelor's degree in Economy	1	14	3700	M	Caesarean
INF6	32	Exclusive breastfeeding	15 minutes	Bank employee	Diploma in Financial	2	6	3900	M	Caesarean
INF7	29	Exclusive breastfeeding	15 minutes	Government employee	Bachelor's degree in Accounting	1	8	3150	M	Normal
INF8	29	Non-exclusive Breastfeeding	15 minutes	Government employee	Bachelor's degree in Medical	1	6	3100	M	Normal
Characteristic of key informants										
IK1	46	-	-	Leader	Bachelor's degree in Economy	-	-	-	-	-
IK2	32	-	-	Co-workers	Master's degree in Public Health	-	-	-	-	-
IK3	30	-	-	Co-workers	Bachelor's degree in Economy	-	-	-	-	-

3.2. Successful Exclusive Breastfeeding

3.2.1 Exclusive Breastfeeding Preparation

Mothers who were successful in giving exclusive breastfeeding had made preparations while they were pregnant. During pregnancy, the informants did breast care, such as keeping the breasts clean, pulling out the nipples, and massaging the breasts by applying baby oil and olive oil. In addition, those mothers regularly consumed milk and foods that were good for their pregnancy, such as green beans and green vegetables. It is in line with some informants' statements:

> *"During pregnancy, I still took vitamins. I also consumed milk while pregnant. After entering the third trimester, I regularly cleaned my breasts, pulled out the nipples, and then applied warm compress, baby oil or olive oil on them (INF1)"*

> *"……massaged my breasts... drank green bean juice... herbal drink, and eat katuk (star gooseberry) leaves". (INF5)*

Other preparations done during pregnancy were doing pregnancy exercise and having regular consultation with a doctor about lactation management. This is supported by the following informant's statement:

> *"Every night I listened to music for a relaxation. Every Wednesday and Saturday, I had pregnancy gymnastics, and once a month I went to a doctor for consultation on lactation management". (INF7)*

Breast care during pregnancy has many benefits and is important to do because the process of lactation has started since the pregnancy. In general, the purpose of breast care is to maintain breast health, especially the hygiene of the nipples, stretch and strengthen the nipple. It is important to stimulate the milk glands, so that the milk production is plentiful and unplugged. It can detect breast abnormalities earlier that will give opportunity for mothers to overcome them. It can also prepare psychological state of mothers to breastfeed (Huliana, 2007). Research conducted by Maga in Gorontalo District shows that breast care during pregnancy is related to milk production (Maga, 2013). Although most mothers had preparations when they were pregnant, not all mothers could provide exclusive breastfeeding in this study. In addition to physical preparation (breast care),another preparation that can be done is having breastfeeding plan to do when returning to work.

The preparation that can be done for a mother when she is at work is to pump her breast milk to be stored in the refrigerator. Therefore, the baby will still have milk supply when the mother returns to work. The informants started pumping breast milk when they returned from hospital after the delivery, a week before coming to work or a month before work again. The informant said:

> *"I started storing milk in the refrigerator from a month before returning to work... (INF7)*

It is necessary for a mother to store milk in the refrigerator by labeling each bottle of milk. Therefore, there will still be milk supply, even though the mother goes back to work. All the exclusive breastfeeding informants did this. In contrast, the mothers who did not give exclusive breast milk were those who did not store their breast milk in the refrigerator. Fikawati and Syafiq (2012) states that a reason some mothers stop giving exclusive breast milk is because she feels that her breast milk is not sufficient for the baby. Their study showed that 36.8% of the respondents perceived that heir breast milk was insufficient (Fikawati, 2012).

Exclusive breastfeeding behavior to do when the mother is still actively working is to pump milk before going to work, while she is working and before returning home. Before leaving for work, the baby is already breastfed. During the break time, the mother usually goes home for breastfeeding. The active return of working mothers is one of the obstacles in the success of exclusive breastfeeding. UK National Survey reported that 19% of mothers did not continue breastfeeding because they had to return to work. Similarly, Scottish survey reported that 28% of mothers did not continue breastfeeding because they needed to return to work. In Spain, 32% of working mothers did not continue breastfeeding when they were already active at work (Kosmala-Anderson, 2006). Several studies have shown that the failure of

exclusive breastfeeding happens when the mother begins to work. Research by Ong et al (2001) showed that the time spent by working mothers at work affected the duration of breastfeeding. Mothers who worked were more likely to stop breastfeeding compared to those who did not work with a Hazard Ratio (HR) of 1.61 (Ong, 2001).

Mother's Knowledge, Motivation and Confidence in Exclusive Breastfeeding

Supporting factors contributing to exclusive breastfeeding success are mother's high intention and motivation, and confidence to be able to give exclusive breastfeeding. An informant's statement supports this idea:

> *"…I believe that breast milk is the best food for babies... I have a strong intention to give exclusive breastfeeding." (INF2)*

The understanding of how to store breast milk is needed, especially for working mothers. The informants who exclusively breastfed their children already knew about how to prepare and sterilize breastfeeding equipment, as well as how to store milk properly. Some of informants' statements are as follow:

> *"…Breast milk which is stored in the freezer can be consumed for up to a year... there must be label containing the storage date and time on the bottle." (INF2)*

> *"Bottles are sterilized first. And then, breast milk is pumped and put into a sterilized bottle. Put it in the refrigerator, some are placed in the freezer, some are below it. If stored in the freezer, it can last up 3 months. If stored in a regular refrigerator, it can be consumed for a period of 2x24 hours." (INF6)*

In addition to intention, belief and confidence, the mother must also have knowledge about exclusive breastfeeding and management of breastfeeding when the mother gets back to work. Not all of the informants knew what is meant by exclusive breastfeeding, especially those who worked in non-health sectors.

Mothers must have a good knowledge of breast milk storage in the refrigerator and how to pump breast milk so as not to cause pain in the breast. Another knowledge a mother must know is how to sterilize breastfeeding equipment. A study conducted by Wattimena *et al*., showed that maternal psychological strength is a driving factor for more than 6 months maternal breastfeeding success (Wattimena, 2012).

In this study, not all mothers knew about exclusive breastfeeding. A Qualitative research by Tarigan and Aryastami shows that mother's knowledge about exclusive breastfeeding varies from one another (Tarigan, 2012).. A study conducted by Sriningsih shows that mother's knowledge is a significant variable that affects exclusive breastfeeding (Sriningsih, 2011).Another study by Abdullah and Ayubi found that about 83.6% of respondents who were exposed to information about exclusive breastfeeding had a good knowledge about exclusive breastfeeding (Abdullah, 2013). Fikawati and Syafiq's research in West Java and Central Java shows that a promotion of exclusive breastfeeding may improve a mother's knowledge about breastfeeding. However, the high knowledge of a mother is not always followed by the practice of exclusive breastfeeding. The percentage of exclusive breastfeeding practice was less than 25% of the total number of mothers who had knowledge about exclusive breastfeeding (Fikawati, 2003).

Qualitative research by Rahmah suggests that failure in breastfeeding is due to a lack of persistence and patience in practicing breastfeeding. Some mothers stop breastfeeding relatively early due to the panic they experience when their children refuse to have breast milk (Rahmah, 2012). Knowledge of lactation management prepares mother to anticipate if there is a complication when they are giving milk to their babies. Government Regulation No. 33 of 2012 shows that Exclusive Breastfeeding information and education must at least includes the following: (1) benefits and advantages of breastfeeding, (2) maternal nutrition, preparation and maintenance of breastfeeding; (3) negative effects of partial bottle feeding on breastfeeding; and (4) difficulties in changing the decision not to breastfeed. Health workers and service facility providers are obliged to provide information and education to mothers and / or families about exclusive breastfeeding(2).

Social Support

Supports from various parties are needed for successful exclusive breastfeeding of working mothers. Supports from boss may be in the forms of attention, dispensation to go home early, and exclusion from out-of-town activities. This is as explained by an informant:

> *I got dispensation; I may come later and go home sooner... In addition, I was not assigned for out-of-town job... (INF2)*

Supports from colleagues are necessary for the success of exclusive breastfeeding. Most informants said that there were supports from their co-workers in breastfeeding. The supports provided were in the forms of motivating, understanding from colleagues, and sharing experiences in breastfeeding practices. The existence of policy from the manager really helped working mothers by arranging more flexible working hours and delegating out-of-town tasks to other colleagues during the time the mother gave exclusive breastfeeding. For working mothers, supports from their colleagues are very beneficial. Understanding and good cooperation from colleagues are very helpful to mothers who are still giving exclusive breastfeeding. This is supported by the Decree of the Minister of Manpower based on Law No. 13/2003 which calls for the company to provide lactation permits during working hours and more flexible working hours.

Supports from the nearest person, such as husband and family, are necessary for the sustainability of breastfeeding. Most informants said that they received supports from husbands and families in providing exclusive breastfeeding. Husband and family support to breastfeeding mothers were manifested in various forms, including taking milk from the mother's office, preparing and sterilizing bottles, searching for breast pumps, finding information, and buying supplementary milk and vitamins for breastfeeding mothers to increase their milk production. Some informants said:

> *"...I asked my husband or my sister for help... if at night I got tired and needed to sleep…I woke up to breastfeed." (INF1)*

> *"My husband always bought me vitamins and dates extract for the flow of breast milk as well as supplementary milk for a breastfeeding mother." (INF8)*

Supports from various parties are needed for exclusive breastfeeding success for working mother. Supports from the nearest person, such as husband and family, are necessary for the sustainability of breastfeeding. The types of husband supports include his role in seeking information about breastfeeding and infant feeding (role 1), involvement in decision making on how to feed children (role 2), selection of venues for pregnancy, delivery, and postnatal / immunization (role 3), involvement in the visit for pregnancy screening (role 4), having positive attitude towards marriage life (role 5), and involvement in various parenting activities (role 6) (Februhartanty, 2008). Ramadhani and Hadi's research (2010) found that mothers who got supports from their husbands were twice as likely to exclusively breastfeed compared to those with less supportive husbands (Ramadani, 2010).

Breastfeeding Facilities

All informants stated that there was not any special room for breastfeeding. Of the 4 informants who gave exclusive breastfeeding, 2 informants pumped his milk in the office. The only available places for pumping were their own room and the prayer room. This fact is supported by the following statements:

> *"There is not any lactation room for breastfeeding. Usually, if I wanted to pump breast milk, I just closed the door in my own room". (INF 1)*

> *The unavailability of a lactation room for breastfeeding is justified by the key informant. The key informant said:*
> *"There is no policy regarding the provision of supporting facilities for breastfeeding." (IK1)*

Availability of facilities to support the success of exclusive breastfeeding consists of two components, namely the availability of facilities in the office such as lactation room and the availability of

facilities owned by mothers such as cooler bags, glass bottles and sterile plastics. There is an association between breastfeeding facilities and exclusive breastfeeding (Abdullah, 2013). The unavailability of adequate breastfeeding facilities at the workplace is also a risk factor for breastfeeding discontinuation Government Regulation No. 33 of 2012 rules out the provision of special facilities for breastfeeding (Amin, 2011). Workplace organizers and public facilities are required to provide breastfeeding facilities in accordance with the conditions and capabilities of the company.

3.3 Barriers Factors in Exclusive Breastfeeding

Barriers factors of exclusive breastfeeding for working mothers are the prohibition to leave the room, being given out-of-town assignments and breastfeeding insufficiency. This is proven by some informants' statements:

> *"Yes, because I work... I rarely breastfeed... I cannot go home during break time, because I work as a teller, so I cannot leave the room." (INF4)*

> *"I often get assignments that require me to go out of town." (INF5)*

The unavailability of lactation room for pumping breast milk, preparing bottles and breast milk pumps is considered troublesome for some mothers. Thus, it is also an exclusive breastfeeding inhibitor. Qualitative research in Kendal, Central Java found that one of the obstacles in giving exclusive breastfeeding is the inconvenience experienced by the mother, such as having too much workload and the long distance between their home and the office, so that the mother cannot go home if the mother wants to breastfeed (Rejeki, 2008). It is recommended that each workplace issue a policy to regulate working hours for breastfeeding mothers. In accordance with Government Regulation No. 13 of 2012, workplace managers and public facility providers should support exclusive breastfeeding programs. Without supports from the workplace, exclusive breastfeeding will be unsuccessful.

4. CONCLUSION

The success of exclusive breastfeeding in working mothers begins with maternal preparation when they are pregnant, while in the hospital, on a work leave and when they return to work. Mothers with high knowledge, intention, motivation and confidence are more likely to give exclusive breastfeeding. Policies and supports from the organizers, husbands and families and co-workers are essential in exclusive breastfeeding. The inhibiting factors of exclusive breastfeeding are situations and conditions of employment that do not allow the employee to leave the room and the assignment to work out of town. It is advisable to the office management to make a written policy on the provision of breastfeeding facilities and more flexible working hours, especially for breastfeeding mothers within the first six months of their breastfeeding period. Forum or community is also necessary for mothers to improve their knowledge about breastfeeding which can also be a medium to share their experiences at exclusive breastfeeding.

ACKNOWLEDGEMENTS

We thank Sukri, S. H. and Marlis SalehS.Sos. from Hang Tuah Foundation Pekanbaru and the Chairman of STIKes Hang TuahPekanbaru, Dr. H. ZainalAbidin, MPH, for the financial support for the implementation of this study. We also thank LPPM colleagues, the Master Program of Public Health ofSTIKes Hang Tuah Pekanbaru and all informants for the support and information provided in this research.

REFERENCES

Abdullah GI, Ayubi D. Determinant of Exclusive Breastfeeding Behavior on Working Mothers. Kesmas. 2013;7(7):298–303.

Amin R, Said Z, Sutan R, Shah S, Darus A, Shamsuddin K. Work related determinants of breastfeeding discontinuation among employed mothers in Malaysia. Int Breastfeed J [Internet]. 2011;6(1):4. Available from: http://www.internationalbreastfeedingjournal.com/content/6/1/4

Bappenas. Kerangka Kebijakan Kerangka Kebijakan Gerakan Sadar Gizi dalam Rangka Seribu Hari Pertama Kehidupan (1000 HPK). 2012.

Basrowi R. Exclusive Breastfeeding on Women in Formal Sector Workers. [Tesis] Magister Kesehatan Kerja Fakultas Kedokteran Universitas Indonesia Jakarta; 2012.

BPS, BKKBN, Kemenkes, DHS M, International I. SDKI: Laporan Pendahuluan. Jakarta; 2012

BPS. Tenaga Kerja Indonesia Naik 0,85%. 2012; Available from: sp.beritasatu.com

Februhartanty J. Strategic Roles Of Fathers In Optimizing Breastfeeding Practices: A Study In An Urban Setting Of Jakarta. [Disertasi] Fakultas Kedokteran Universitas Indonesia; 2008.

Fikawati S, Syafiq A. Maternal Nutritional Status and Breast Milk Insufficiency Perception. Jurnal Kesehatan Masyarakat Nasional. 2012;6(6):249–54.

Fikawati S, Syafiq A. Relationship between immediate breastfeeding and exclusive breastfeeding for 4 months. J Kedokt Trisakti. 2003;22(2):47–55.

Huliana M. Healthy Pregnancy Guide. Jakarta: Puspa Swara; 2007.

Indonesia R. Peraturan Pemerintah No.33 Tahun 2012 Tentang Pemberian ASI Eksklusif [Internet]. 2012. Available from: www.gizikia.depkes.go.id

ILO. Tren Ketenagakerjaan dan Sosial di Indonesia 2013 [Internet]. 2013. Available from: http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo jakarta/documents/publication/wcms_233250.pdf

Kosmala-Anderson J, Wallace LM. Breastfeeding works: The role of employers in supporting women who wish to breastfeed and work in four organizations in England. J Public Health (Bangkok). 2006;28(3):183–91.

Maga I, Hakim B ZA. Determinant Factors of Breastfeeding Production in Breastfeeding Mothers at Talaga Jaya Community Health Center Gorontalo Province. 2013; Available from: pasca.unhas.ac.id

Martha E, Kresno S. Qualitative Research Methods for Health. Jakarta: Rajawali Press; 2016.

Mitra. Faktor-Faktor yang Berhubungan dengan Kelangsungan Pemberian ASI Eksklusif di Indonesia. Kesehatan Masyarakat. 2010;4(2):82–7.

Ong G, Yap M, Li FL, Choo TB. Impact of working status on breastfeeding in Singapore: Evidence from the National Breastfeeding Survey 2001. Eur J Public Health [Internet]. 2005;15(4):424–30. Available from: http://eurpub.oxfordjournals.org/cgi/doi/10.1093/eurpub/cki030

Ramadani M, Hadi EN. husband's support in exclusive breastfeeding at working areas of Puskesmas Air Tawar, Padang. Kesmas, J Kesehat Masy Nas. 2010;4(6):269–74.

Rahmah L. Attribution of Breastfeeding Failure to Working Mothers (a Phenomenological Study). J Psikol Proyeksi. 2012;6(1):62–70.

Rejeki S. Study of Phenomology: Exclusive Breastfeeding Experience Mother works in Central Java Kendal Region. Media Ners. 2008;2(1):1–13.

Riskesdas. Riset Kesehatan Dasar. Badan Penelit dan Pengemb. 2007

Riskesdas. Riset Kesehatan Dasar. Badan Penelit dan Pengemb. 2013

Scrimshaw NS, Gleason GR. Rapid Assesment Procedures: Qualitative Methodologies for Planning and Evaluation of Health Related Program. Boston: International Nutrition Foundation for Developing Countries; 1992.

Sriningsih I. Demographic Factors, Mother's Knowledge of Mother's Milk and Exclusive Breastfeeding. Kemas J Kesehat Masy. 2011;6(2):100–6.

Tarigan IU, Aryastami NK. Knowledge, Attitude and Behavior of the Mother of the Baby to the Breast Feeding Exclusively. Bul Penelit Sist Kesehat. 2012;15(4):390–7.

Wattimena I, Susanti NL, Marsuyanto Y. Women ' s Psychological Strengths in Breastfeeding. Kesmas, J Kesehat Masy Nas. 2012;7(12):56–62.

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Physical Activity Among Undergraduate University Students

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Article Info

Keyword:

Physical activity,
Body mass index,
Supporting factor,
Inhibiting factor,
Adolescent,
Young adult.

ABSTRACT

Lack of physical activity may increase the risk of non-communicable diseases. The purpose of this study was to investigate student's participation in physical activity, the relationship between physical activity and body mass index (BMI) and factors supporting and inhibiting physical activity among university students. Cross-sectional study with mixed-method design was conducted. The samples of the study were students of Public Health Study Program, Universitas Ahmad Dahlan (PHSP UAD) in the second semester who joined Biomedical II laboratory work. The quantitative research was done by exploring student's participation in physical activity with Global Physical Activity questionnaire from WHO and BMI measurement. Qualitative research with focus group discussion (FGD) is conducted on two groups of students, namely physically active and inactive to explore factors supporting and inhibiting physical activity. Total of 186 respondents participated in the study. The majority of respondents (79%) did not meet WHO recommendations on physical activity for health. BMI measurement showed 65.7% respondents were within normal limit. Thirty two respondents (17.2%) were overweight and obese, and 75% among them were physically inactive. Analysis of relationship between physical activity and BMI with Pearson Chi-Square showed p value of0.770 ($p>0.05$). Individual and environmental factors were identified as factors supporting and inhibiting physical activity. Majority of PHSP students did not meet WHO recommendations on physical activity for health. Physical activity had no significant relationship with BMI. Individual and environmental factors were identified as factors supporting and inhibiting physical activity. Policies at faculty and university level and cross-sectoral collaboration are needed to support physical activity among undergraduate university students.

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1. INTRODUCTION

Human body is created to move (Edwards, 2008). Every movement of the body produced by skeletal muscles in our bodies that require energy expenditure is defined as physical activity by WHO (WHO, 2017). Moderate intensity of physical activity, such as walking, cycling, or participating in sport regularly - is proven to have a positive impact on health by reducing the risk of non-communicable diseases (NCDs) such as heart disease, hypertension, stroke, diabetes, cancer and depression. Cardiorespiratory and muscle fitness, and improving bone health are other benefits of physical activity that can reduce the risk of falling and fractures and help control bodyweight by keeping the balance of energy intake and energy expenditure (WHO, 2017).

WHO formulates global recommendation on physical activity for health. The recommendations set out in the document addressing three age groups: 5–17 years old; 18–64 years old; and 65 years old and above. Recommended level of physical activity for 18-64 years olds includes recreational or leisure-time physical activity, transportation (for example : walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities (WHO, 2010). In order to improve cardiorespiratory and muscular fitness, bone health and reduce the risk of NCDs and depression, the recommendations for 18-64 years old group are the accumulation of moderate-intensity aerobic physical activity for at least 150 minutes / week or at least 75 minutes of vigorous-intensity aerobic physical activity per week, or an equal combination of the two. Aerobic activity should be performed in bouts of at least 10 minutes duration (WHO, 2010). The best way to be physically active can be achieved by integrating physical activity with at least moderate intensity of physical activity (such as brisk walking, and other activities that make the body warm and breathe faster) into everyday life(Edwards, 2008).

Lack of physical activity caused by sedentary lifestyle causes energy imbalance and the risk of overweight and obesity, which further increases the risk of NCDs. Statistic Indonesia projected that by 2035 in Indonesia, the proportion of children aged 0-14 years and age> 65 years will decrease. While the proportion of age 15-64 (productive age) will increase. If the productive age group suffers from chronic illness, the productivity will be lost and the projected cost of health services until 2030 due to NCDs will continue to increase, which will add burden to the country (Statistic Indonesia, 2017).

The results of the fitness test of the students of Public Health Study Program, Universitas Ahmad Dahlan (PHSP UAD) which was done in Biomedical I laboratory work showed that the majority of students achieved unsatisfactory result. Therefore, this study aimed to explore student's participation in physical activity, the relationship between physical activity and body mass index (BMI) and factors supporting and inhibiting physical activity among university students. The results of the study will be the important database to formulate health promotion in physical activity among those included in the age group.

2. RESEARCH METHODS

This study is a cross sectional study with mixed-method design. The samples of the study were students of PHSP UAD in the second semester who joined Biomedical II laboratory work. This quantitative research was done by exploring student's participation in physical activity with Global Physical Activity questionnaire from WHO and BMI measurement. The qualitative research with focus group discussion (FGD) was conducted on two groups of students, namely physically active and inactive to explore factors supporting and inhibiting physical activity.

3. RESULTS AND ANALYSIS

A total of 197 respondents participated in the study. Eleven questionnaires could not be used due to incomplete responses, inconsistent data, excessive time estimation of physical activity performed and participation of foreign student. A total of 186 data were analyzed.

3.1. Quantitative research

3.1.1. Univariate analysis:

Majority of participants were adolescent (87.6%), female (88.2%), belonged to middle-class family (86%), and living in the area around UAD campus 3 where the PHSP UAD was located (71%). Participation in physical activity showed that majority of respondents did not meet WHO recommendation (79%), and 17.2% of the respondents' BMI belonged to overweight and obese categories. Detail of the descriptive data can be seen in Table 1,2, and 3 below.

Table 1.Characteristic of respondents(n=186)

No		Categories	Frequency	%
1	Age	Adolescent (17-19 years old)	163	**87,6**
		Adult (20-21 years old)	23	12,4
2	Sex	Male	22	11,8
		Female	164	**88,2**
3	Family income	Lower class (< USD 208)	24	12,9
		Middle class (USD 208- 2080)	160	**86,0**
		Upper class (> USD 2080)	2	1,1
4	Residence	Around campus 3 UAD (Warungboto district)	132	**71,0**
		Far from campus 3 UAD (Outside of Warungboto district)	54	29,0

Table 2.Participation in physical activity

	Categories	Frequency	%
Physical activity	Meet WHO recommendation	39	21,0
	Not meet WHO recommendation	147	**79,0**

Table 3.Body mass index (BMI)

	Categories	Frequency	%
BMI	Underweight (<18,5)	33	17,7
	Normal (18,5 – 25)	121	**65**
	Overweight & obese (>25)	32	17,2

The results of this study indicate that the majority of physical activity done by PHSP UAD students did not meet WHO recommendations. The results of this study are in line with the results of a systematic review that has been done by Ranasinghe C, Ranasinghe P, Jayawardena R, Misra A in 2013 and a study by Kahan in 2015. A systematic review of research articles from Nepal, Bangladesh, India, Srinlanka, Buthan and Maldives countries showed that adults in South Asia are not physically active in their spare time (Ranasinghe, 2013). A study byKahan compared data of Global Physical Activity questionnaire and the International Physical Activity questionnaire from 38 Muslim countries with 94 non-Muslim countries. The results show that the sedentary lifestyle in Muslim country is higher compared to non-Muslim country (Kahan, 2015). Several studies have shown that men are more physically active than women(Hancock, 2011; Sjögren and Stjernberg, 2010); Wenthe, 2009). Meanwhile, the majority of respondents in the study were female (88.2%).

3.1.2. Bivariate analysis

Analysis of relationship between physical activity and BMI with Pearson Chi-Square showed p value of 0.770 (p>0.05) as seen in Table 4 below.

Table 4.Relationship between physical activity and BMI

Physical activity	BMI			Total	P value
	Underweight	Normal	Overweight & obese		
Meet WHO recommendation	7	24	8	39(21%)	0,770
Not meet WHO recommendation	26	97	24	147(79%)	
Total	33(17,7%)	121(65%)	32(17,2%)	186(100%)	

Although the result showed that 75% of those who were overweight and obese were inactive, the bivariate analysis in this study showed that physical activity did not affect BMI with p value of 0.77. This is not in line with research conducted by Parson & Power(Parsons, 2005). The study concluded that women

who are physically active at the age of 16-42 years will experience less BMI changes than women who are inactive (2.1 vs 2.5 kg/m2/10 years). Decreased physical activity in men in adolescence to middle adulthood, and physical inactivity in women in both stages of life can lead to an increase in BMI.
Although population studies show that BMI has a strong correlation with body fat percentage, BMI cannot give information on significant variation of body fat distribution at individual level. Indirect body composition analysis, such as anthropometry and BMI, is not always appropriate to examine body composition in detail, since neither can assess the distribution of ectopic fat tissue (fatty deposits in undesirable places: liver, muscle and pancreas)(Thomas, 2012).
The presence of fat in the internal organs (visceral) has a specific metabolic risk of metabolic disorders of fat and sugar, compared to sub-cutaneous fat deposits. Research on the presence of fat in the body with MRI shows that many individuals who tend to be lean may have more visceral fat tissue compared to those who are overweight / obese. This sub-phenotype is called TOFI (Thin Outside Fat Inside) that is identified both in males and females and increases the risk of individuals exposed to metabolic diseases. Individuals with TOFI have a higher visceral fat ratio compared to subcutaneous fat in the abdomen. Some of the identified causes of TOFI are physical inactivity, old age, sex hormones, food composition and genetic factors (Thomas, 2012).
Although the majority of BMI in this study are not in overweight and obese category, sedentary lifestyle could induce TOFI sub-pheno type in this group. Further research is expected to explore metabolic disorder, such as hypertension, diabetes and dyslipidemia in this age group.

3.2. Qualitative Research

FGDs were conducted in two groups separately (active and inactive). Ten students participated in active group and four students in inactive group. Both groups were facilitated by senior students of PHSP UAD in their final year. Two senior students as facilitator were chosen to create a conducive environment for the participants to express their opinion. The facilitators were trained during their study in PHSP UAD and well informed with the topic discussed in FGD.
Questions in both groups consist of seven domains: (1) current behavior and lifestyle, (2) geographical information, (3) awareness and knowledge, (4) values, beliefs and attitudes, (5) health, ability and level of confidence, (6) cultural norms and social networks, (7) access and use of existing facilities.

Supporting and inhibiting factors in physical activity

Two major factors, namely individual and environmental factors were identified as factors supporting and inhibiting physical activity. Details of the factors are listed in the table 3 below.

Table 5. Supporting and inhibiting factors in physical activity

	Supporting	Inhibiting
Individual factors	Good physical condition and having skills needed for physical activity such as running, jumping, throwing, catching, kicking, and maintaining balance.	The existence of competitor to be physically active, such as teaching learning process in campus and engagement in several organizations. Respondent 14: *"Since I was in senior high school, I spent a lot of my time with studying and sleeping"*
	Self-confidence and self-motivation to be physically active.	Low motivation. Respondent 11: *"I am lazy to be physically active, I am too tired"*
	Having health problems, such as physical and psychological problems (examples: obesity and discomfort) Respondent 4*:* *"I will be active physically if I feel that my weight is increasing"*	Belief in having physical problems even if it is not supported with objective data. Respondent 11: *"When I was a child, I was diagnosed to have problem in my*

		lung, and I spent six months for treatment. As a result, I am too afraid to run again, because I will feel as if I am having breathing difficulty even if I am not "
	Awareness of the benefits of physical activity and the disadvantages of sedentary lifestyle *a.* Respondent 10: *"To increase immune system and physical fitness"* b. Respondent 13: *"It causes fatigue, irregular heartbeat, high cholesterol, and many other diseases such as joint pain"*	
	Ability to put physical activity as a hobby and combine physical activity with other activities such as listening to the music, and competition.	
Environmental factors	Ownership of motor vehicle and the distance of residence to campus Some participants who have no motor vehicle, walk for daily transportation	Respondent 6: *"My house is far away from UAD. It takes me 45 minutes if there is a traffic jam and 30 minutes without traffic jam."*
	External support (friends, family) Respondent 11: *"If my parents see me doing nothing in my house in Kalimantan Island, he will ask me to run, jog, or play badminton. My little brother also ask me to do the same (jog)"*	Lack of support. Respondent 6: *"I love playing volley ball, and I must do it in a group. Now my friends are busy with their task and their work and we cannot do it anymore"*
	Organizations or programs that support physical activity in the neighborhood or campus. Respondent 5: *"In my neighborhood, I have a group for cycling. We will ride our bicycles every Sunday morning or Saturday evening"*	Parenting style. Respondent 14: *"My dad asks me to stay at home because I am a woman, do nothing, and not to go out too often. So, I spent a lot of my time playing with my cat and sleeping".*
		Traumatic experience in the past, such as drowning. Respondent 11: *"My parents support me to swim but I had bad experience while I was swimming (drowning). Now I am afraid to swim again"*

The results of qualitative research identified several factors supporting and inhibiting physical activity. To summarize, they are categorized into two factors, i. e. individual and environmental factors. Individual factors include: motivation, hobby, knowledge of the benefits of physical activity and risk of sedentary lifestyle, self-confidence, self-esteem, the ability to combine physical activity with something they like, skills possessed of physical activity, and physical and psychological condition. Environmental factors include: teaching and learning activities on campus, parenting style, external support from family and

friend, the distance of residence to campus, ownership of motor vehicles, and participation in the clubs / organizations.

Based on the results of qualitative research and considering the amount of time spent at campus, it is expected that universities can create a supporting environment to support active lifestyle. Colleges / universities should educate and support young people to have healthy lifestyle, serve as a role model, and provide sport facilities that are accessible to students at no cost and variety of extra-curricular activities that support physical activity. Universities also need to create policies that support physical activity, such as the rules of motor vehicles utilization and parking (i.e. rules for walking from residence and parking space to the campus are athat can be reached by walking briskly for at least 10 minutes), set the day of Krida (sports day) in UAD, physical fitness tests and supporting active lifestyle on student admission. Universities can also collaborate with relevant partners (police, local government) to provide a safe route to walk to campus[1]. In addition to individual, environmental, and policy factors, the university can also develop personal skills, by helping students with time management to be physically active (WHO, 2009).

4. CONCLUSSION

Majority of PHSP students did not meet WHO recommendations on physical activity for health. Physical activity had no significant relationship with BMI. Individual and environmental factors were identified as factors supporting and inhibiting physical activity. Policies at faculty and university level and cross-sectoral collaboration are needed to support physical activity among undergraduate university students.

REFERRENCES

Edwards P &Tsouros AD. *A Healthy City is an Active City: A Physical Activity Planning Guide*. WHO. 2008.

Hancock C. *Review The benefits of physical activity for health and well-being*. C3 Collaborating for Health. 2011.

Kahan D. Adult physical inactivity prevalence in the Muslim world: Analysis of 38 countries. *Preventive Medicine Reports*. 2015.

Parsons TJ, Manor O, Power C. Physical activity and change in body mass indexfrom adolescence to mid-adulthood in the 1958 British cohort. *International Journal of Epidemiology*; 35:197–204. 2005

Statistic Indonesia. *ProyeksiPenduduk, Mercusuar Pembangunan Negara*. Available at: https://www.bps.go.id/KegiatanLain/view/id/85. 2017.

Sjögren and Stjernberg. A gender perspective on factors that influence outdoor recreational physical activity among the elderly. *BMC Geriatrics*, 10:34. 2010.

Ranasinghe et al. *International Journal of Behavioral Nutrition and Physical Activity*. 10:116. .2013.

Thomas EL, Frost G, Taylor-Robinson SD, Bell JD. Excess body fat in obese and normal-weight subjects. *Nutrition Research Reviews*, 25, 150–161. 2012.

Vigorous Physical Activity. *Pediatric Exercise Science*. August ; 21(3): 291–304. 2009

Wenthe PJ, Janz KF, Levy SM.. Gender Similarities and Differences in Factors Associated with Adolescent Moderate- WHO. *Milestones in Health Promotion*, *Statements from Global Conferences.* 2009.

WHO. *Physical Activity*. WHO. Available at: http://www.who.int/topics/physical_activity/en/. 2017.

WHO. *Global recommendations on physical activity for health*. 2010.

Carpal Tunnel Syndrome on Traditional Boat Driver in Kutai Kartanegara District of East Kalimantan

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Article Info

Keyword:

Carpal Tunnel Syndrome
Traditional Boat,
Driver.

ABSTRACT

A cross-sectional study was conducted on 45 drivers of traditional boat in Kutai Kartanegara to identify carpal tunnel syndrome (CTS) prevalence and its risk factors.The independent variables consisted of age, vibration, heat pressure, working period, working time, and history of disease, while the dependent variable was CTS. The research instruments used were Phalen test, vibration analyzer, heat stress area monitor and questionnaire. Chi square and multiple logistic regression were applied to identify the correlation between CTS prevalence and other parameters. The results showed that the CTS prevalence of 82.2% was found, and it correlated significantly with age (p=0,000), vibration (p=0,000), length of work (p=0,000), working period (p=0,000), and history of disease (p=0.019). History of disease, length of work, and exposure of vibration are the most dominant variables affecting CTS. It is suggested for stake holders to improve the primary prevention efforts.

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1. INTRODUCTION

Kutai Kartanegara is one of districts in East Kalimantan traversed by Mahakam River. In addition of land transportation, one type of transportation that is still used by people in this area is boat. This type of water transport is used in informal sector which is an alternative transportation and used by the public to serve transport from one place to another on the banks of Mahakam river. The ships are still operated manually and have not yet applied the principles of occupational health and safety, causing boat drivers to be at risk for occupational diseases. One type of occupational diseases caused by long and repeated excessive emphasis on the arm up to the wrist and exacerbated by vibration exposure is carpal tunnel syndrome (CTS).

CTS is a suppression of the median nerve, extending between the forearm to the hand inside the carpal tunnel with symptoms of pain, numbness, and paresthesias (tingling or burning) (Jagga, 2011; Lewanska, 2017). CTS is associated with work combination of strength and repetition of the finger motion in a long period of time. CTS can be triggered by exposure to vibration or due to un-ergonomic positions that occur over a long time (Bridger, 2009). National Health Interview Study (NHIS) estimates, in USA, the reported CTS prevalence among adult populations is 1.55% (2.6 million) and is more common in women than in men ranging from 25 to 64 years of age, with the highest prevalence in women aged > 55 years (Luckhaupt, 2013).

CTSis a musculoskeletal disorder of the upper limbs that has caused considerable material loss. The estimated medical costs to be paid for CTS exceed $2 billion per year, mainly because the patients have to undergo surgery. Meanwhile, losses due to non-medical costs are much greater. CTS experienced by a workforce results in a loss of 27 working days. An estimate of 18% of workers developing CTS is reported to leaving their jobs within 18 months. It was concluded that CTS has resulted in decreasing work productivity and increasing disability rate(Stapleton, 2006; US Bureau of Labor ans

Statistic, 2012; Foley, 2007). In Indonesia, national research on occupational CTS has never been done. Nevertheless, studies in some areas of certain types of work have proven that CTS incidents are found in Bank employees (Saerang, 2015), garment workers (Tana, 2004),and jasmine pickers (Kurniawan, 2008).

CTS risk factors consist of occupational factors(working at high speed, repetitive motion, heavy-loaded work using wrists and vibration exposure) and non-occupational factors (sex, age, body mass index, smoking habits, and pregnancy status) (Maghsoudipour, 2008).This study aims to determine the prevalence of CTS in boat drivers in Kutai Kartanegara (district of East Kalimantan province in Indonesia) and analyze the factors that influence it.

2. RESEARCH METHOD

The cross-sectional study was conducted from October until December 2016 on all boat drivers (45) in Kutai Kartanegara district of East Kalimantan province, Indonesia.The independent variables consist of age, working period, working time, vibration, heat stress, and history of disease, while the dependent variable is CTS. To examine the symptoms of CTS Phalen test method (Massy-Westroop, 2000) was used. Vibration analyzer was used to measure the vibration exposure. Heat stress area monitor was used to examine the heat pressure of the working environment. Age, working period, working time, and history of disease were examined by using a questionnaire. The data analysis was done by using chi square (bivariate) and logistic regression test (multivariate) with α=0.05.

3. RESULTS AND ANALYSIS

Out of the 45 drivers, they were all male, mostly over the age of 30 (84.4%), with education level of mostly high school (53.3%). Most of them had a working period of over 4 years (82.2%), average length of work of more than 8 hours per day (91.9%) (see table 1). Most respondents experienced CTS (82.2%), with the following details: left hand complaints of 24.4%, right hand complaints of 28.9% and complaints on both hands of 28.9%; the types of CTS experienced by the workers were mostly pain (46.5%) and tingling (31%); most CTS occurred at an uncertain time, whether at work or when not working (55%); the locations of complaint were mostly on the thumb, forefinger, middle finger and ring finger (51.7%); most of respondents had a history of illness that could complicate CTS (80%), including diabetes mellitus (8 people), rheumatoid arthritis (16 people), injuries (8 people), gastritis (3 persons) and typhoid (1 person). The heat pressure or ambient temperature exceeded the threshold limit value of 33.90 C (51.1%) and most respondents were exposed to hand and arm vibration (see table 2).

The statistical test showed that age (p=0,000), vibration exposure (p=0,000), working time (p=0,000), working period (p=0,000), and history of disease (p=0,019) were related to the CTS. Meanwhile, heat pressure was not related to CTS (p=0,649) (see table 3). Age, working period, working time, history of disease, exposure to vibration, and exposure to heat stress had a significant partial effect (sig <0.05). Nagelkerke R Square (0.867) indicated the ability of independent variables in explaining the dependent variable was 86.7%, the remaining 13.3% was explained by other variables outside this study. The magnitude of influence can be seen from the value of Exp (B) or also called Odds Ratio (OR) for each variable, i. e. age (0.34), working period (1.1), working time (5.3), history of disease (9.8), exposure of vibration (4.4),and exposure to heat pressure (2.3). It can be concluded that history of disease, working time and exposure of vibration are the three most dominant variables affecting the incidence of CTS in traditional boat drivers in Kutai Kartanegara.

3.1. Prevalence of Carpal Tunnel Syndrome

The prevalence of CTS in traditional boat drivers in Kutai Kartanegara was 82.2% (n=45). The location of CTS complaints was mostly on the thumb, forefinger, middle finger and ring finger (51.2%). The type of CTS complaints was dominated by pain (46.6%) and tingling (28.8%). The result indicated that CTS experienced by traditional boat driver in Kutai Kartanegara was very serious and required immediate control action. Unresolved CTS will adversely affect both the physiology of the body and the work. As reported by Faucet et al (Faucett, 2000), physiologically, unresolved CTS will lead to worse conditions such as disability due to sensory damage and motor nerve function. Meanwhile, from the socio-economic aspect, CTS can cause social and economic losses, including job loss and job change.

These results may complement previous studies in other district in Indonesia and some country which conclude that the prevalence of CTS in bank employees in Bitung was 28% (n=47) (Saerang, 2015), in garment workers in Jakarta was 20.3% (n=814) (Tana, 2004), injasmine pickers in Purbalingga was 47.2% (n=72) (Kurniawan, 2008), in grinding workers in Surabaya was 87.2% (n = 43) (14), in

traditional soccer-making workers in India was 66.67% (n=70) (Kumar, 2016), in female visual display unit workers in Italy was 7.6% (n=48) (Ricco, 2016), in female hairdressers in Turkey was 74.3% (n=150) (Demiruyek, 2018), in non-medical hospital staff in Taiwan was 51.9% (n=144) (Chiang, 2017), in US working population was 7.8% (n=4321) (Dale AM, 2013), and in nurses in Kuala Lumpur was 7.5% (n=80) (Ithin, 2012)

3.2. Result of bivariate analysis

Age, working period and working time are related to CTS. The results reinforce previous studies who conclude that the incidence of CTS is associated with age and working period (Kumar, 2016; Ricco, 2016; Atcheson, 1998).Age and working period are associated with the incidence of CTS due to the increasing age of bone degeneration and this condition will occur at the age of 30 where degeneration occurs in the form of tissue damage, alteration of tissue into scar tissue, fluid reduction that causes the stability of the bone and muscle to be reduced (Demiruyek, 2018). The longer a person works, the longer the emphasis on the median nerve is, which will aggravate carpal tunnel syndrome (Chiang, 2017).To reduce the severity of CTS due to old age and working period, it is advisable to reduce workload and working hours, provide adequate rest, and work properly (Lutmann, 2003).

We found that vibration exposure was associated with CTS. The result is in line with previous studies which conclude that exposure to vibration in the arm, excessive emphasis on wrist and repetitive movement are significantly associated with an increase in the incidence of CTS. Vibration exposure is associated with CTS because the vibration will increase muscle contraction. Static contraction that makes the blood circulation not smooth increases accumulation of lactic acid and eventually causes or aggravates muscle soreness (Barcenilla, 2012; Van Rijn, 2009).To reduce the adverse impact of vibration exposure, drivers are advised to take some control measures as suggested by Work Safe Alberta (Government of Alberta, 2010) such as: buying/using low vibration engine, reducing boat engine speed, performing routine maintenance, using vibration damping pads on steering boats, and using anti-vibration gloves.

Heat pressure is not related to CTS. The results do not support previous studies which conclude that the increase in heat temperature causes increased pressure on the median nerve and further reduces the pressure on the carpal and median nerve ligaments with a suggestion to apply cold compress (Laymon, 2015). Exposure to cold temperature or excessive heat can cause decreased agility, sensitivity, and muscle strength so that the worker movements become sluggish with a difficulty to move, accompanied with decreased muscle strength. Different environment temperature from body temperature on a high extent can make the body energy be used excessively to adapt to the environment. If there is not a sufficient energy supply, there will be a shortage of energy supply in the muscle that can cause muscle pain (Tarwaka, 2010).In this study, the work location of the driver was in an open space where no extreme heat exposure occurred due to the use of a boat protective roof. This is why CTS is not affected by heat exposure in this study.

We found that repetitive movement is related to CTS. The results are consistent with previous study by Newington (Newington, 2016) who concludes that repetitive movement is a significant factor that affects the incidence of CTS and Bridger (Bridger, 2009) who concludes that repetitive activity, rapid movement, wrong position/ posture, and carrying a heavy load can stimulate the pain receptor nerve. Pain occurs because the muscles receive pressure due to continuous workload without giving a chance to relax.To reduce the severity of CTS due to repetitive movement, it is advisable to avoid manual handling of heavy objects, reduce mass of objects or number of handlings per day, and reduce repetition frequency (Lutmann, 2003).

History of disease has been associated with CTS. In this study, 35.6% of respondents suffered from rheumatoid arthritis, 17.8% suffered from diabetes mellitus, and 46.6% suffered from gastritis, typhoid and injury. The results are consistent with previous studies which conclude that CTS can be caused or can be aggravated by some metabolic diseases (such as diabetes, amyloidosis, obesity, pseudo gout, hypothyroidism, mucopolysaccharidosis and various arthropathies) and other diseases such as hormonal diseases, vascular diseases and diseases related to allergic reactions (Atcheson, 1998; Bugajska, 2007). Based on these results, to prevent and improve the rhematoid arthtritis conditions experienced by drivers, we recommend that drivers do physical activity exercises. According to Cooney, et al. (Cooney, 2011), regular physical activity exercises can be improved with cardiorespiratory fitness and cardiovascular health, increased muscle mass, reduced adiposity (including attenuated trunk fat), improved strength, and physical functioning, all achieved without exacerbation of disease activity or joint

damage. For other health problems experienced by the drivers, we recommend them to do routine medical check-up and obey the doctor's advice. They can improve their health conditions through the implementation of a clean and healthy lifestyle.

3. 3 Result of multivariate analysis

History of disease, working time and vibration exposure are the three most dominant variables affecting CTS in traditional boat drivers in Kutai Kartanegara. The results are consistent with previous studies which conclude that neuropathic factors (such as diabetes, vitamin deficiency, exposure to toxins, alcoholism), extrinsic factors (such as a history of post-traumatic arthritis), and occupational factors (such as false posture for a long time, repetitive movement, vibration exposure) are the primary risk factor that are often associated with CTS (Ibrahim, 2012). The implications of these results are priorities in the management and prevention of CTS in the future. Health and safety stakeholders are advised to improve the health status of boat drivers, improve health safety knowledge and perception, and assist in improving working conditions.

4. CONCLUSION

The prevalence of Carpal Tunnel Syndrome in traditional boat drivers in Kutai Kartanegara was 82.2% (n=45). Age (p=0,000), working time (p=0,000), working period (p=0.000), repetitive movement (p=0,000), vibrational exposure (p=0,000), and history of disease (p=0.019) are associated with CTS incidence. Exposure to heat stress is not related to CTS (p=0.649). History of disease, working time and vibration exposure are the most dominant variables affecting CTS. It is recommended to increase primary prevention efforts by health workers, such as socialization of CTS disease, prevention and treatment, increased knowledge and perceptions about CTS, and safe boat driving, improvement of work environment, restrictions on working time in accordance with government regulations, regular muscle exercise, and further medical examination/health monitoring by health personnel.

ACKNOWLEDGEMENTS

The authors are very grateful to all of the traditional boat drivers participated in this study. This study received no funding support and the authors declare that there is not any conflict of interest.

REFERENCES

Asworth, N,L. Carpal Tunnel Syndrome. BMJ Clinical Evidence. 2014:1114.

Atcheson SG, Ward JR, and Lowe W. Concurrent Medical Disease in Work-Related Carpal Tunnel Syndrome. Arch Intern Med. 1998;158(14):1506-1512

Barcenilla, A, March, LM, Chen, JS, Sambrook,. PM. Carpal Tunnel Syndrome and Its Relationship to Occupation: A Meta-Analysis. Journal of Rheumatology. 2012;51:250-261.

Bridger, R. S. Introduction to Ergonomics. Broken Sound Parkway NW: CRC Press; 2009.

Bugajska, J, Jedryka-Góral, A, Sudoł-Szopińska, I, Tomczykiewicz, K. Carpal Tunnel Syndrome in Occupational Medicine Practice. Int. Jounal of Occupational Safety and Ergonomics (JOSE). 2007;13(1):29-32.

Chiang CL, Liao CY and Kuo HW. Postures of upper extremity correlated with carpal tunnel syndrome (CTS). Int J Occup Med Environ Health. 2017;30(2):281-290

Cooney JK, Law RJ, Matschke V, et al. Benefits of exercise in rhematoid arthtritis. J Aging Res. 2011; Article ID 681640;(14p). DOI:10.4061/2011/681640

Dale AM, Harris-Adamson C, Rempel D, Gerr F, Hegmann K, Silverstein B, Burt S, Gang A, Kapellusch J, Merlino L, Thiese MS, Eisen EA, Evanoff B. Prevalence and incidence of carpal tunnel syndrome in

US working populations: pooled analysis of six prospective studies. Scand J Work Environ Health. 2013;39(5):495–505

Demiruyek BE and Gundogdu AA. Prevalence of carpal tunnel syndrome and its correlation wiyh pain amongst female hairdressers. Int Journal Occup Med and Environ Health. 2018;31(3):333-339

Faucett J, Blanc PD, and Yelin W. The impact of carpal tunnel syndrome on work status: Implication of job characteristics for staying on the job. J Occup Rehab. 2000;10(1):55-69

Foley, M, Silverstein, B. The Economic Burden of Carpal Tunnel Syndrome: Long-Term Earnings Of CTS Claimants In Washington State. American Journal of Industrial Medicine. 2007;50**:**155–172.

Government of Alberta, Employment and Immigration. Best Practices-Vibration at the work site. Jan 2010. (cited 2018 April 25). Available from: https://work.alberta.ca/documents/WHS-PUB_gs007.pdf

Ibrahim I, Khan WS, Goddard N, S. Carpal Tunnel Syndrome. The Open Orthopaedics Journal. 2012;6:69-76.

Ithnin A, Kong D, and Venkataraman S. Occupational risk factors for carpal tunnel syndrome among nurses in medical. Int J Public Health Reseacrh. 2012;2(2):137-143

Jensen, JC. Development of Neck and Hand-wrist Symptoms in Relation to Duration of Computer Use at Work. Scandinavian Journal of Work Environment and Health. 2003;29:197-205.

Kumar, S, Muralidhar, M. Analysis for Prevalence of Carpal Tunnel Syndrome in Shocker Manufacturing Workers. Advances in Production Engineering & Management. 2016;11:126–140.

Kurniawan, B, Jayanti, S, Setyaningsih, Y. Faktor Risiko Kejadian Carpal Tunnel Syndrome (CTS) pada Wanita Pemetik Melati di Desa Karangcengis, Purbalingga (Risk Factors of Carpal Tunnel Syndrome (CTS) Occurrence in Female Melati Pickers in Karangcengis Village, Purbalingga). Jurnal Promosi Kesehatan Indonesia. 2008;3:31-37.

Laymon, M, Petrofsky, J, McKivigan, J, Lee, H, Yim, J. Effect of Heat, Cold, and Pressure on The Transverse Carpal Ligament and Median Nerve: a Pilot Study. Medical Science Monitor. 2015;21:446-451

Luttmann A, Jager MA, Griefahn B, et al. Preventing musculoskeletal disorders in the workplace. Geneva: WHO; 2003.

Lewańska, M, Walusiak, J. Is Ulnar Nerve Entrapment at Wrist Frequent Among Patients with Carpal Tunnel Syndrome Occupationally Exposed To Monotype Wrist Movements? Int Journal of Occupational Medicine and Environmental Health. 2017;30(6):17-30.

Luckhaupt, SE, Dahlhamer, JM, Ward, BW, Sweeney, MH, Sestito, JP. Prevalence and Work-Relatedness of Carpal Tunnel Syndrome in The Working Population United States 2010. National Health Interview Survey. American Journal of Industrial Medicine. 2013;56: 615–624.

Maghsoudipour, M, Moghimi, S, Deghhaan, F, Rahimpanah, A. Association of Occupational and Non-occupational Risk Factors With The Prevalence of Work Related Carpal Tunnel Syndrome. Journal of Occupational Rehabilitation. 2008;18:152-156

Massy-Westroop N, Grimmer K, Bain G. A systematic review of the clinical diagnostic test for carpal tunnel syndrome. J Hand Surg. 2000;25(1):120-127

Newington, L, Harris, CE, Walker-Bone, K. Carpal Tunnel Syndrome and Work. Best Pract. Res. Clin. Rheumatol. 2016;29:440-453.

Pangestuti, A.A, Widajati, N. Faktor Yang Berhubungan Dengan Keluhan Carpal Tunnel Syndrome Pada Pekerja Gerinda di PT DOK dan Perkapalan Surabaya (Factors Associated With Carpal Tunnel Syndrome Complaints In Gerinda Workers at PT DOK and Shipping Surabaya). The Indonesian Journal of Occupational Safety and Health. 2014;3(1):14–24.

Ricco M, Cattani S and Signorelli C. Personal risk factors for carpal tunnel syndrome in female visual display unit workers. Int J Occup Med Environ Health. 2016;29(6):927–936.

Saerang, D, Kembuan, MK. Insiden Carpal Tunnel Syndrome Berdasarkan Anamnesis Pada Karyawan Bank di Kota Bitung Sulawesi Utara (Carpal Tunnel Syndrome Incidence Based on Anamnesis At Bank Employees in Bitung City North Sulawesi). Journal E Clinic (Ecl). 2015;3:1.

Stapleton, MJ. Occupation and Carpal Tunnel Syndrome. ANZ Journal of Surgery. 2006;76: 494–496.

Suma'mur, PK. Higene Perusahaan dan Kesehatan Kerja (Occupational Health and Industrial Hygene). Jakarta:PT Gunung Agung; 1999,.

Tana, L, Halim, FS, Delima, Ryadina. W. Carpal Tunnel Syndrome pada Pekerja Garmen di Jakarta (Carpal Tunnel Syndrome on Garment Workers in Jakarta). Buletin Penelitian Kesehatan. 2004;32:73-82

Tarwaka. Ergonomi Industri, Dasar-Dasar Pengetahuan Ergonomi dan Aplikasi di Tempat Kerja (Fundamental of Ergonomic and aplication in the workplace). Surakarta: Harapan Press; 2010.

US Bureau of Labor and Statistics, US Department of Labor, 2011. Nonfatal occupational injuries and illnesses requiring days away from work, 2010. USDL report number: 11-1612. Retrieved October 3, 2012, from: http://www.bls.gov/news. release/osh2.nr0.htm

Van Rijn, RM, Huisstede, BM, Koes, BW, Burdorf, A. Associations Between Work Related Factors and The Carpal Tunnel Syndrome. A Systematic Review. Scandinavian Journal of Work Environment and Health. 2009;35:19-36.

Winn, FJ, Krieg, EF. The Regression Model for Carpal Tunnel Syndrome. Proc Society for Experimental Biology and Medicine. 1989;192:161–165.

Attachment:

Table 1. Characteristics of Traditional Boat Drivers in KutaiKartanegara District of East Kalimantan (n=45)

Characteristic	Category	Frequency	%
Age (years)	< 30	7	15,6
	≥ 30	38	84,4
Education	Elementary school	10	22,2
	Junior high school	11	24,4
	Senior high school	24	53,3
Working period (years)	< 4	8	17,8
	≥ 4	37	22,2
Working time (hours/day)	< 8	4	8,9
	≥ 8	41	91,9

Table 2.Distribution of carpal tunnel syndrome (CTS) in Traditional Boat Drivers in KutaiKartanegaradistrict of East Kalimantan

Variables	Category	Frequency	%
CTS	Yes	37	82,2
	No	8	17,8
Hand affected CTS	Right	11	24,4
	Left	13	28,9
	Right and Left	13	28,9
Type of CTS complaint	Pain	21	46,6
	Tingling	13	28,8
	A sense of shock	4	8,8
	Weak	5	11,1
	Difficulty of grasping	2	4,4
Location of CTS complaint	Thumb, forefinger, middlefinger and ringfinger	23	51,2
	Palm	7	15,5
	Another place	15	22,2
Time of CTS complaint	When working	10	22,2
	Evening	10	23,3
	Uncertain	25	55,5
History of disease	Yes	36	80
	No	9	20
Type of disease	Diabetes mellitus	8	17,8
	Rheumatoid arthritis	16	35,6
	Injury	8	17,8
	Gastritis	3	6,7
	Typhoid	1	2,2
Heat pressure	< 33,9^{0}C	22	48,9
	≥ 33,9^{0}C	23	51,1
Vibration	< 74,5 m^2/sec	19	42,2
	≥ 74,5 m^2/sec	26	57,8

Table 3.Association between CTS prevalence with age, vibration, heat stress, working time, working period and history of disease

Independent Variables		CTS				Total		*P Value*
		No		Yes				
		N	%	n	%	n	%	
Age (years)	< 30	5	71,4	2	28,6	7	100	0,000
	≥ 31	3	7.9	35	92,1	38	100	
Vibration	< 74,5 (low)	8	42,1	11	57,9	15	100	0,000
	≥ 74,5 (high)	0	0	26	100	30	100	
Heat pressure	< 33,9 (low)	5	22,7	17	77,3	22	100	0,646
	≥ 33,9 (high	3	13	20	87	23	100	
Working time	< 8 hours	7	77,8	2	22,2	9	100	0,000
	≥ 8 hours	1	2,8	35	97,2	36	100	
Working period	< 4 years	7	87,5	1	12,5	8	100	0,000
	≥ 4 years	1	2,7	36	97,3	37	100	
History of disease	No	4	44,4	5	55,6	9	100	0,019
	Yes	4	11,1	32	88,9	36	100	

BIOGRAPHIES OF AUTHORS

I am IwanMuhamadRamdan. I have completed my Doctoral degree with CGPA 3.87 (out of scale 4) and Master degree with CGPA 3.56 (out of scale 4) at GadjahMada University of Indonesia. I got government scholarship in Both Doctoral and Masters degree. I am a lecturer and researcher at Department of Occupational Health and Safety, Public Health Faculty Mulawarman University. My research interest in occupational health and safety both formal and informal sectors. I have already participating in international and national conference on public health which had been held in Asean and Australian region. I am active member of Indonesia Public Health Association, Indonesian Ergonomic Association and also Asian Pacific Academic Consortium for Public Health. I actively conduct research to improve the health conditions of the informal sector in East Kalimantan.

I am FauziRidwan, I have completed my bachelor degree with 3.59 CGPA (out of scale 4) at Public Health Faculty Mulawarman University. I am interested to learn more about health and safety because in this field there are still many challenges. I want to help the government in reducing the number of workplace accidents and occupational diseases. I am active in scientific meetings related to health and safety. I also aspire to go to college to pursue a master so it can explore the science of health and safety, and can be beneficial for the industry and labor in Indonesia.

The Relationship Between Energy Consumption and Heat Stress of Dodol Stirrer

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Article Info
***Keyword*:**
Metabolism,
Workload,
Heat Stress Index,
Productivity.

ABSTRACT
Process heat caused by the body's metabolism to carried out the job would cause the body temperature to rise. The body temperature will continue to rise if the work is done on a workspace that has a heat source. These working conditions have on the process making dodol where workers metabolism increasing with the increased workload due to the increased viscosity of dodol. Excessive workload tends to accumulate in the body heat resulting in an increase in body temperature that can cause stress. As a result, workers tend to avoid the excessive heat to stay away from work areas that may result in damage to the product dodol. In this study, these problems were observed using the method of direct measurement of the variables strss cause by heat (heat stress) were measured using a formulation of the Heat Stress Index (HSI) was associated with a Percentage of Cardiovascular (% CVL). HSI is calculated based on the temperature measurement at 5 measurement point at a height of about 0.6 meters from the floor. The results of the study a significant correlation between temperature increases with increase in HSI is the higher the temperature the higher the HSI values. While the value of the workload will increase with the increase in the value of HSI. The average value of HSI was above 90 indicates that the work carried out led to sustained heat stress. The high value of the HSI will cause the workload carried higher. Therefore improvements to the HSI values one of which can be done by facilitating worker by manually stirring dodol mixer semi-automatic. This facility will be able to reduce energy consumption around the workers is more than 35%. Thus labor productivity tends to be increased and the stress caused by heat (heat stress) can be reduced.

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1. INTRODUCTION

Heat stress is a significant factor in occupational health and safety of workers in industries. Heat stress is a combination of individual heat load and environmental factors imposed on workers' bodies. After investigating the heat stress among workers in different workplaces, it is indicated that rise in environmental temperature has a significant and negative impact on workers' performance, attitude, satisfaction level and output. Dynamic and frequent interaction among workers and the workplace induce physiological and psychological tensions, which bring about sensitivity, irritation, and anxiety, and have direct impact on their performance, output, and health, and safety. Thus, the awareness to impacts of workplace conditions on workers is important to improve the workers' performance and the output, and to prevent workplace accidents.

Workplace heat stress is a well-known occupational health hazard. Climate change, characterized by the increased frequency and intensity of extreme heat, makes the risk more severe and widespread. Heat stress is prevalent in numerous industrial and commercial occupational settings, either outdoors or indoors. Operations that involve high environmental heat, physically demanding activities or impermeable protective clothing have a high potential for incurring heat stress among exposed workers. Heat stress causes physiological and psychological discomforts, deteriorates performance and productivity, increases incident rates and even threatens survival. Increased thermoregulatory, cardiovascular and perceptual strains on the body promote confusion,

irritability and other emotional stress, which may cause workers to become distracted from tasks or ignore safety procedures. Understanding the effects of heat stress and implementing appropriate intervention strategies to relieve the harmful impacts of heat stress have been the focus of a significant number of studies. Studies on this nature require a multi-disciplinary approach involving physiology, management, and technology. The effects of heat stress can be described by physiological and psychological responses. Management of heat stress utilizes a set of framework, principles, processes and measures to prevent injuries, accidents and other adverse consequences. Technology in terms of techniques, tools, systems and machineries has been adopted as an effective means to protect workers from the hazardous effects of heat stress. Humans have a tightly regulated internal body temperature range (approximately 37°C at rest) in which homeostatic processes are optimal (i.e. optimal structural and kinetic coordination of molecular, cellular and systemic processes). Our behavioural adaptive capabilities are vast and paramount when managing thermal environments or reducing thermal loads. Conversely, the effectiveness of our heat dissipation capacity is related to what type of clothing is worn and the environmental conditions. Indeed, our mechanisms can maintain a homeostatic internal body temperature within only a relatively narrow range of thermal environments Thus, thermal stress can directly alter operational capacity, both by decreasing work tolerance and also by requiring changes to work scheduling such as increased rest and recovery periods.

According to the research conducted at an automotive parts manufacturer with a press and welding specialty in which workers were easily exposed to heat stress, it was found that the effects of heat stress on workers' physiology and psychology were exceeding WGBT heat stress index from the threshold value and the TWL resulting in an unrestricted area. Inner body temperature, heartbeat, and urine specific gravity values after shift work increased, and a psychological response was shown by welding workers; the specific symptoms that emerged were excessive thirst and sweating, heat prickle, muscle cramps, and increased pulse rate, temperature, and urine specific gravity. In conclusion, heat stress exposure from press and welding activities affected workers' physiology and psychology (Atiq, 2015)

Cold stress can rapidly reduce manual dexterity (Cheung et al. 2003; Heus et al. 1995), increase the work involved in balancing and maintaining posture (Makinen et al. 2005), increase neuromuscular strain from a given task (Sormunen et al 2009), and reduce the total work capacity and increasing the risk for chronic issues such as repetitive strain injuries. Furthermore, cognitive functioning, decision making, and task performance may be impaired by both heat and cold stress (Hancock et al. 2007; Pilcher et al. 2002), and this can increase the risk of accidents in the workplace.

In physical work, energy consumption is a major factor that is used as a benchmark of the weight or lightness of a job. The data is quantitative data, consisting of heart rate or pulse rate and energy consumption. Heart rate or pulse rate is used to measure one's self from muscle attack. The greater the muscle activity, the greater the fluctuation of the movement of the heart rate will be. In addition, the pulse can also be used to strengthen the physical condition or degree of physical fitness of a person. Heart rate (measured per minute) can be used to measure a person's level.

Humans have components in maintaining energy balance and body temperature balance in the range of 37.0 ± 2 ° C, which are the hypothalamus, food intake, sweat glands, blood vessels and muscle. The use of energy by the body produces heat that is important in the regulation of body temperature. Humans can live in several regions with different temperatures. Therefore, they must continue to withstand the temperature of the body, because the speed of a cell's chemical reaction depends on body temperature. Excessive heat can damage cell proteins. One of the causes is the high environmental temperature at the production level. The highre the heat in the work environment is, the higher the operator heart rate is much needed. The thermal conditions are reliable and also the discomfort in working. Work-offs can be caused by exposure to heat in the workplace. Exposure to heat occurs when the body absorbs or generates greater heat than is received through a thermal regulatory process. Exposure to heat due to high temperatures in the work space can be caused by the condition of the room, the machine tool that releases heat and heat that comes from the sun that heats the roof of the factory which then generate heat in the production work room. These supporting theories are used in the research.

Dodol production SME Company is a commercial enterprise engaged in the production of food, *Dodol*. The processing of *Dodol* was largely done manually, one of which is stirring *Dodol*. The operator uses a spoon stirrer, which is approximately 1 meter long, to stir *Dodol* for 5 hours to mature the *Dodol*. The production is carried out every day and the *Dodol* weighs approximately 20 kg per cauldron. SMEs alone can produce 4 to 6 crock *Dodol* per day, subject to availability and booking. Heat that occurs on the production floor can be seen in Figure 1.

Figure 1. Smoke from *Dodol* Cooking Stove

SNI 16-7063-2004 determines the room temperature threshold was at 25.9°C whereas the temperature in the production floor reached 34.98°C. Therefore, research is required to find a solution to the problem. This condition makes operators receive heat exposure resulting in increased pulse rate.

The process of stirring *Dodol* was done for 5 hours to complete. Exposure to heat comes from the stove and cooking pot. The stirring process is done manually with *Dodol* ladle, which is 1 meter long. The stirring *Dodol* operator can be seen in Figure 2.The *Dodol* stirring process is done manually by using a cauldron above the stove and stirring the *Dodol* with a stirring spoon. The operator will stir the ingredients of the *Dodol* until it is cooked for 5 hours. The process causes the increase in operator pulse due to the *Dodol* mass, whereas the longer it is cooked, the heavier it will be. Cooking Stoves and cooking pots for cooking and stirring *Dodol* can be seen in Figure 3.

Figure 2. *Dodol* Stirring Operator

Figure 3. Cooking Stove, *Dodol* Cauldron, and Stirrer

Dodol cooking process is done with wood and charcoal fuel. The heat source is under the cooking stove. The heat spread comes from the smoke coming out of the Cooking Stove and around the cauldron. The cooking process and the radiation from the sun go directly into the production room, causing heat, so that the operator feels the excessive heat, resulting in increased pulse and heavier workload.

Such conditions lead complaints for receiving the heat exposure and pain in several parts of the body, including the back, left and right shoulders, and neck which allows the risk of musculoskeletal injuries. Worker complaints can be analyzed by using Standard Nordic Quetionnaire (SNQ). The workload is calculated using a direct valuation method to calculate energy consumption and the percentage of cardiovascular and heat stress index value calculation.

2. RESEARCH METHODS

This research was conducted at *Dodol Sejahtera* SMEs. The research is a correlational study because it aimed to know the relationship between energy consumption and heat stress of *Dodol* stirring operator. The object of research was observed *Dodol* mixer operator. Research execution procedure consisted of several phases:

1. Preliminary studies and literature
   Observations of the work station to look for problem-solving methods, as well as supporting the theories
2. Identification of the initial problem
   Identifying the pain complaints of the *Dodol* stirring operator
3. Data collection
   Data needed in this research were the operator data, the layout of the measurement point, data on pain complaints in the body by using Standard Nordic Questionnaire (SNQ), the resting pulse rate and pulse rate of the operator, air temperature, temperature of the globe, humidity, and wind velocity.
4. Data processing
   The first stage was to determine the dimensions of the body of the operator who had complaints of pain by using *Standard Nordic Questionnaire* (SNQ). And then, the workload was calculated using energy consumption and percentage of cardiovascular. Finally, the value Heat Stress Index (HSI) was calculated.
5. Analysis of problem-solving
   The analysis was performed on the results of data processing by looking at pain complaints received from the operator and comparing the relationship between energy consumption and percentage of cardiovascular with the value of HSI gained.
6. Conclusions and recommendations
   Conclusions relating to research and suggestion for improvements for the company

3. RESULTS AND DISCUSSION

3.1. Standard Nordic Questionare (SNQ)

Based on the assessment of SNQ results, it was found that the biggest complaints occurred in the following parts of the body; the back, lower neck, left shoulder and right, left and right upper arms and waist. The percentage and category of very ill of the three operators can be seen in Figure 4.

In Figure 4, the percentage calculations were performed to see which operators had painful and very painful complaints. The SNQ questionnaire showed the complaint score of each body dimension. The calculations indicated which operators experienced pain complaints and were very sick while processing the *Dodol*. A very painful pain complaint is shown in red graph, and the pain complaint is shown in blue graph.

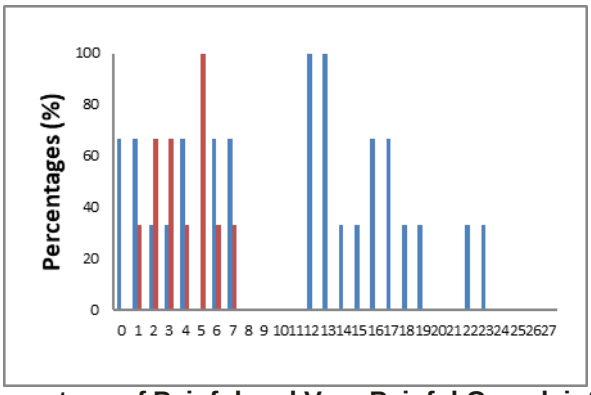

Figure 4. Percentage of Painful and Very Painful Complaint Categories

The painful and very painful complaints indicate that the *Dodol* stirring work causes the operator's body painful due to repetitive and long-term work every day, i.e. for 5 hours. The graph above shows that the body part that has the highest number of pain complaint is number 5, which is the back body part of the three operators. Then the next very sick complaint is body dimension number 2 and 3, which are the left shoulder and right shoulder experienced by 2 operators. Pain in dimension number 1 (lower neck), 4 (upper left arm), 6 (upper right arm), and 7 (waist) was experienced by 1 operator. The blue chart shows the pain complaints experienced by the operator. This is what can cause an increase in the worker's pulse resulting in more severe workload for the operator.

3.2. Physical Workload

Measurement of physical workload was done by measuring the pulse break and work of *Dodol* mixer operator. The equation to calculate the energy consumption required by the operator is:

$$Y = 1.80411 - 0.0229038 \text{ to } 4.71711 \text{ x } 10\text{-}4X^2$$

where :
Y = Energy (kcal / min)
X = Heart rate (beats per minute)

The recapitulation of the calculation of energy consumption for each operator can be seen in Table 1.

Table 1 shows that the average amount of energy consumption required by operators falls in the heavy workload classification. Energy consumption spent by operators to stir *Dodol* was very high which indicated that the work load was categorized as heavy. Classification of heavy workload was based on the value of energy consumption resulted in fatigue and complaints of pain in the body experienced by the operator of *Dodol*. The highest energy consumption value was experienced by operator 3 which was 392.44 Kcal/ min, followed by operator 2 with 366.74 Kcal/ min, and operator 1 with 357.73 Kcal/ min. Based on the analysis of pain complaints by using SNQ, the pain complaints experienced by the operator were caused by the heavy workload, as shown in Table 2.

Table 1. Each operator's Energy Consumption

Time	Manner	Working Pulse			Energy Consumption (kcal / h)			Average		
		opr 1	opr 2	opr 3	opr 1	opr 2	opr 3	opr 1	opr 2	opr 3
10:00	1	102	100	105	261.20	253.85	277.19	263.79	261.34	280.10
	2	102	102	105	261.20	261.20	277.19			
	3	103	103	107	268.97	268.97	285.91			
12:00	1	118	118	118	338.31	338.31	338.31	351.18	342.50	346.70
	2	120	118	120	350.90	338.31	350.90			
	3	122	120	120	364.34	350.90	350.90			
14:00	1	128	133	140	394.06	428.17	467.55	410.92	440.82	482.20
	2	130	136	143	410.52	447.14	489.53			
	3	133	136	143	428.17	447.14	489.53			
16:00	1	128	130	136	394.06	410.52	447.14	405.03	422.29	460.74
	2	130	133	140	410.52	428.17	467.55			
	3	130	133	140	410.52	428.17	467.55			

Then, the calculation of workload was based on the percentage of cardiovascular:

$$\%CVL = \frac{(DNK - DNI)}{DNMaks - DNI} x\ 100\%$$

where: Max heart rate = 220 – age

Recapitulation of the calculation of %CVL for each operator can be seen in Table 2.
Based on the calculation of CVL%, it can be seen that the average workload is classified as heavy, which needs necessary repairs. The highest percentage value of CVL is also experienced by operator 3 with 47.16%, followed by operator 2 with 44.1%, and operator 3 with 42.37%.

Table 2. Each Operator's %CVL

Time	Manner	Working Pulse			%CVL (%)			Average		
		Opr 1	Opr 2	Opr 3	Opr 1	Opr 2	Opr 3	Opr 1	Opr 2	Opr 3
10:00	1	102	100	105	26.23	24.07	24.75	26.73	25.66	25.41
	2	102	102	105	26.23	25.64	24.75			
	3	103	103	107	27.73	27.27	26.75			
12:00	1	118	118	118	39.87	40.41	37.92	41.91	41.14	39.59
	2	120	118	120	41.88	40.41	40.43			
	3	122	120	120	43.97	42.59	40.43			
14:00	1	128	133	140	48.43	54.94	61.21	50.83	56.81	63.56
	2	130	136	143	50.80	57.74	64.74			
	3	133	136	143	53.28	57.74	64.74			
16:00	1	128	130	136	48.43	52.25	57.83	50.01	54.04	60.08
	2	130	133	140	50.80	54.94	61.21			
	3	130	133	140	50.80	54.94	61.21			
								42.37	**44.41**	**47.16**

The amount of workload is caused by an increase in operator's pulse rate compared to the maximum pulse rate. The workload of operator 3 was the heaviest due to age, whereas he was older than the other workers. Furthermore, he had been working longer, hence the greater pain complaints, leading to higher work pulse rate. The amount of workload received by the operator was what would be associated with the value of HIS to find out whether the high workload was influenced by the high value of acquired HSI.

3.3. *Heat stress index*

HSI calculation starts with determining the point of measurement parameters used in the HSI, by determining the point made at the place where the operator performs the *Dodol* stirring. Layout of measurement points can be seen in Figure 2.

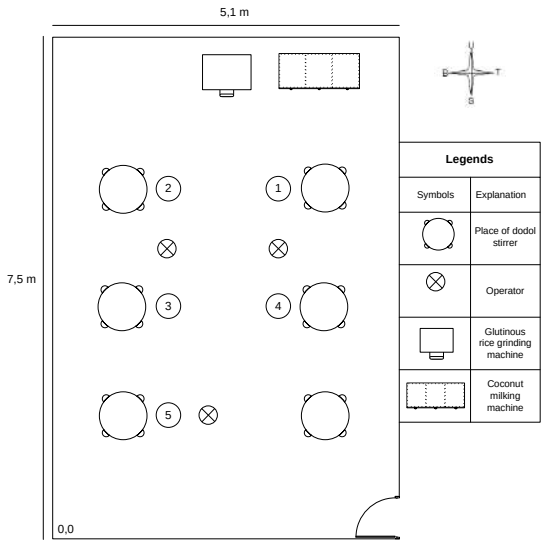

Figure 5. Layout Point Measurement

Figure 5 shows that the total measurement points were 5, indicating where the operator stirred *Dodol*. The production floor was exposed to heat, as well as in each Cooking Stove and cauldron, so that the measurement was done in the 5 points.

The value of HSI (Heat stress index) was calculated based on air temperature, globe temperature, humidity, and wind speed. HSI calculations were performed based on point, altitude, and time. Graph of air temperature can be seen in Figure 6.

Figure 6 shows that the air temperature affects time and height, where the higher the measuring point, the higher the temperature is. Measurement of HIS value was done in 2 ways, i. e. based on points and altitude gradient, and based on point and time. The second measurement was done to see the direct relationship between the value of HIS and the workload based on the time measurement. Time also affected the temperature, humidity, and wind speed, where time affected by the sun's heat and the cooking conditions of *Dodol*, resulting in increased temperature.

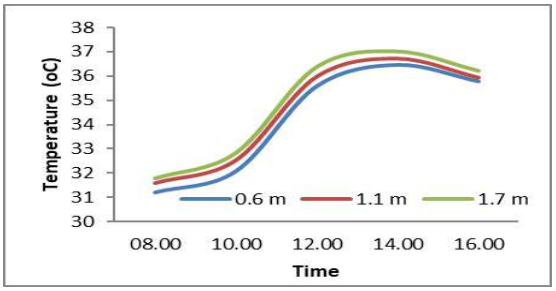

Figure 6. Air Temperature Graph

However, at 16:00 there was a decrease in temperature due to the decreased heat of the sun. Calculations were performed using the following formula:

HSI = Ereq / Emax

$$tr = \left[(tg + 273)^4 + \frac{1{,}1\,x10^{8}v^{0,6}}{\varepsilon d^{0,4}}\,x\,(tg - ta)\right]^{0,25} - 273$$

$$\left[(37{,}12+273)^4+\frac{1{,}1x10^{8}0{,}42^{0,6}}{0{,}95x0{,}15^{0,4}}x\,(37{,}12-34{,}36)\right]^{0,25}-$$

$$=273$$

= 40.47

Pa = $Rhxe^{18,956-(\frac{4030,18}{ta+235})}$mb

= $0,636\ x\exp(^{18,956-(\frac{4030,18}{34,36+235})})$ mb

= 34.5 mb

= 3.45 kPa

R = K1 (35-tr)
= 4.4 (35 to 40.47)
= - 24.05

C = K2 v0,6 (35-ta)
= 4.6 x $0.42^{0.6}$ (35 to 34.36)
= 1.75

Ereq = M - R - C
= 180 - (-24.05) - 1.75
= 202.30

Emax = 7.0 $v^{0.6}$ (56-pa)
= 7.0 $0.42^{0.6}$ (56 to 3.45)
= 218.58

HSI = $\frac{Ereq}{Emax}\ x\ 100 = \frac{202,30}{218,58}\ x\ 100$ = 92.55%

Recapitulation of HSI value of each point based on gradient height can be seen in Table 3.

Table 3. Value HSI Based on point and Altitude

Point	Altitude gradients	*tr*	Pa	R	C	Ereq	Emax	HSI (%)
1	**0.6**	40.47	3:45	-24.05	1.75	202.30	218.58	92.55
	1.1	40.50	3:48	-24.19	0.68	203.50	227.07	89.62
	1.7	40.90	3:46	-25.96	0:06	205.90	234.40	87.84
2	**0.6**	40.54	3:26	-24.36	2:18	202.18	224.34	90.12
	1.1	40.82	3:31	-25.63	1:26	204.37	230.23	88.76
	1.7	41.08	3:32	-26.75	0:54	206.21	242.72	84.96
3	**0.6**	40.00	3:40	-22.01	2:49	199.51	217.55	91.71
	1.1	40.54	3:36	-24.36	1.69	202.66	219.59	92.29
	1.7	40.79	3:40	-25.48	0:57	204.92	226.81	90.35
4	**0.6**	40.64	3:42	-24.83	1:49	203.34	221.22	91.92
	1.1	40.81	3:45	-25.57	0.80	204.77	227.20	90.13
	1.7	40.82	3:48	-25.61	0:12	205.50	230.12	89.30
5	**0.6**	40.66	3:30	-24.92	3:01	201.92	227.26	88.85
	1.1	40.92	3:35	-26.05	1.93	204.15	237.25	86.05
	1.7	41.14	3:34	-27.03	1:10	205.94	243.20	84.68
Average								89.28

Based on Table 3, it can be seen that the average HSI value obtained is 89.28%. Based on the classification of the values, it can be concluded that the HSI values calculated are included in the very high category, which can cause heat stress on the operator *Dodol* stirring. The highest HSI value was 92.55%. The value of the HSI at point 1 and altitude gradient 0.6 m was affected by altitude, temperature, humidity, and wind speed. The highest HSI value was at an elevation of 0.6 m due to the heat source coming from the Cooking Stove being at that height. In addition, factors of wind speed and humidity affected the high value of Heat Stress Index of air movement and humidity due to a lower altitude of 0.6 m.

HSI value calculation is also based on a point and time to see the effect of time on the magnitude of HSI. The value of the HSI by point and time can be seen in Table 4.

Based on the table above, the average value of HSI was equal to the value of HSI based on point and gradient height, which was 89.28%. The highest percentage of HSI was at a point 4 at 14:00. The value of the HSI was affected by time, temperature, humidity, and wind speed. The highest heat exposure was at point 4 at 14:00 due to the effect of time, in which the position of stirring at four points were near the door and were directly exposed to sun heat. By measuring the value of HSI that has been done, it can be seen that there is a very high heat exposure to *Dodol* stirrer operator which causes operators to feel fatigue and increased working pulse.

3.4. Relationship Between Heat Stress Index and Energy Consumption

Based on the data that has been processed for the calculation of the HSI by point and time, we can see the relationship between workload and energy consumption at a predetermined time. In this discussion, gradient elevation for each point is equal. The chart of the relationship between time and HSI can be seen in Figure 7.

Table 4. HSI Value Based on Point and Time

Point	Time	*tr*	Pa	R	C	Ereq	Emax	HSI (%)
1	8:00	39.38	3:01	-19.27	7.93	191.35	220.41	86.82
	10:00	41.15	3:06	-27.04	7:22	199.82	229.52	87.06
	12:00	40.36	3.81	-23.59	-4.56	208.15	226.28	91.99
	14:00	41.36	3.88	-27.98	-5.05	213.03	230.96	92.24
	16:00	40.85	3.66	-25.74	-1.70	207.45	225.90	91.83
2	8:00	40.23	2.81	-23.03	9.82	193.21	231.60	83.42
	10:00	40.92	3:01	-26.05	5:29	200.76	232.77	86.25
	12:00	40.59	3:51	-24.59	-2.32	206.91	231.60	89.34
	14:00	41.30	3.66	-27.71	-3.77	211.48	230.91	91.59
	16:00	41.04	3:57	-26.58	-2.46	209.04	235.29	88.85
3	8:00	40.34	2.82	-23.50	10:29	193.21	219.10	88.18
	10:00	40.89	2.99	-25.93	7:08	198.85	222.60	89.33
	12:00	40.61	3.68	-24.67	-3.58	208.24	224.81	92.63
	14:00	40.81	3.80	-25.55	-3.79	209.34	220.22	95.06
	16:00	39.54	3.77	-20.00	-2.30	202.30	219.33	92.24
4	8:00	40.18	2.89	-22.77	9.89	192.88	224.07	86.08
	10:00	40.86	2.91	-25.77	8:41	197.36	229.16	86.12
	12:00	40.70	3.72	-25.08	-3.40	208.48	225.63	92.40
	14:00	41.70	4:06	-29.46	-7.15	216.62	226.17	95.78
	16:00	40.38	3.83	-23.66	-3.97	207.64	225.19	92.21
5	8:00	40.10	2.77	-22.46	10:54	191.92	228.73	83.91
	10:00	41.38	2.93	-28.09	7.89	200.20	233.14	85.87
	12:00	40.24	3:55	-23.05	-0.10	203.15	233.41	87.04
	14:00	41.50	3.94	-28.60	-5.36	213.97	240.41	89.00
	16:00	41.22	3:59	-27.37	-3.76	211.13	243.01	86.88
Average								89.28

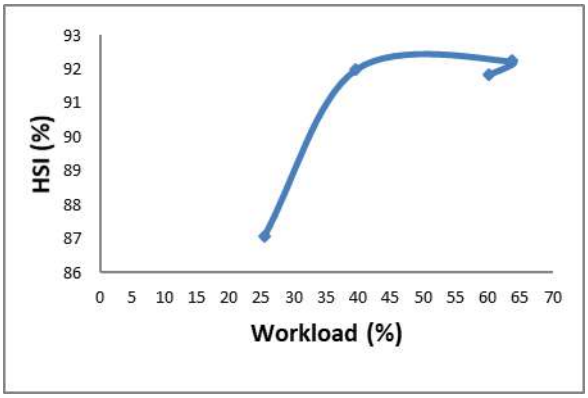

Figure 7. Relationship Chart Energy Consumption by HSI against Time

Figure 7 shows the relationship between the percentage of energy consumption and HSI. In the graph, it can be seen that the higher the HSI values, the higher the amount of energy consumption required by the operator. The high energy consumption is influenced by increased pulse rate because the higher the exposure to the heat received by the operator, the faster the heart pulse rate is. However, in the picture above, we can see that there was a decline in HSI value at 16:00, followed by a decrease in operator workload. It was caused by the reduced heat radiation from the sun, as well as from the heat source of the *Dodol* stirrer's Cooking Stove. The decrease of heat in the Cooking Stove was because the *Dodol* is already done and no larger needed heat. Increased pulse caused the heavy work load received by the operator. Heavy workload required high energy consumption. Therefore, the required amount of energy consumption was also getting bigger, resulting in heavy workload.

3.5. Facility Design

The design of semi-automatic facility of *Dodol* stirrer is done by calculating the original dimension of the *Dodol* stirrer and the operator's anthropometry. Body dimensions used are Standing Elbow Height (TSB), Standing Shoulder Height (TBB), and JT (Hand Range). The actual dimensions of the *Dodol* mixer can be seen in Figure 8.

Figure 8. Dimensions of the Cooking Stove and Cauldron of *Dodol*

Dimensions of *Dodol* stirrer that had been measured were used for the process of designing a new *Dodol* stirring machine. The actual *Dodol* stirrer still caused an increase in the operator's working pulse, making the workload of the operator heavy. The design of the new facility considered the percentile based on the operator's anthropometry.

3.6. Anthropometric measurements

3.6.1. Determination of Anthropometric Data with Extreme Principles

Anthropometric data using the extreme principle of the three body dimensions is the JT (Hand Range) dimension with extreme bottom principle (percentile 5)

Calculation of JT percentile:

$$P_5 = \bar{x} - k_5 s = 79{,}75 - (1{,}645x5{,}3) = 70{,}98$$

3.6.2. Determination of Anthropometric Data by Average Principle

Anthropometric data using the average principle of the three body dimensions is the TSB (Elbow Standing) and Shoulder Standing (TBB) dimensions by using the 50th percentile.

TSB percentile calculation:

$$P_{50} = \bar{x} + k_{50}s = 103{,}67 + (0x4{,}5) = 103{,}67$$

Calculation of TBB percentile:

$$P_{50} = \bar{x} + k_{50}s = 139{,}69 + (0x7{,}2) = 139{,}69$$

3.7. Designing Support System

After discussion for alternative selection, a new design for making *Dodol* was obtained in accordance with anthropometry of the operators' body. The dimensional design of *Dodol* stirring machine is as follows.

1. Stove height : 103.67 cm
2. Fuel Source : Wood and charcoal
3. Cauldron Material : Aluminium
4. Stove Material : Iron
5. Cauldron dimension : 70.98 cm
6. Rotation stirrer height : 139.69 cm

The stirring machine design can be seen in Figure 9.

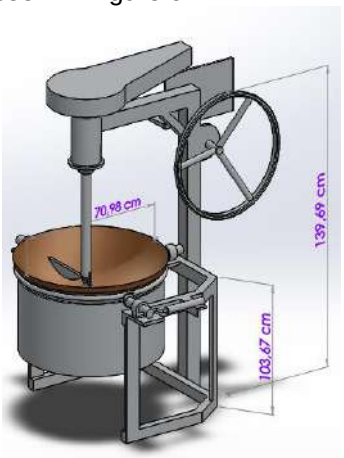

Figure 9. Specification of *Dodol* Stirring Machine Design

The design of the *Dodol* stirrer engine is semi-automatic, where the engine uses a motors in stirring, but the operator still does the job of supervising and stirring in a certain time to ensure that the stirring cycle does not make the sticky *Dodol* to the cauldron. The depiction of the machine with the operator can be seen in Figure 10.

Figure 10. Operator Using *Dodol* Stirring Machine

Stirring *Dodol* using the machine will make the operators not work continuously and repeatedly, so that operators will not receive fatigue that will affect their pulse rate. Stirring *Dodol* is done when it is time to check whether the *Dodol* is sticky. In addition, the decrease in workload will also occur

because the operator does not need to be continuesly exposed to heat because the operators are not always near the stove. This decreases the operator's workload to 35% because the operator's pulse rate also decreases.

4. CONCLUSION

The conclusion from the study is that the HSI values are influenced by several variables, such as air temperature, wind speed, humidity, altitude, and time. The value of the HSI will affect the energy consumption required by the operator. The average value obtained from the percentage of HSI second calculation was equal to 89.28%. The calculation of the HSI by point and height was 92.55% at point 1 and at the height of 0.6 m. Meanwhile, the HSI calculation based on the point and time of HSI values was 95.78% at point 4. The results of the study show that there is a significant correlation between temperature and HSI, where the higher the temperature, the higher the HSI values will be. On the other hand, the value of the workload will increase with the increase in the value of HSI. The average value of HSI was above 90, indicating that the work carried out led to sustained heat stress. The high value of the HSI will cause the workload carried higher.

The calculation of energy consumption showed that the highest energy consumption was 482.20 Kcal/ hour, and was experienced by operator 3. The relationship between the amount of energy consumption by using the HSI calculation and time due was also calculated in order. It showed that the larger the value of HSI, the greater the consumption of energy required by the operator.

The design of the *Dodol* stirring machine was based on the anthropometry calculation of the operator's body. The design result was a semi-autonomous *Dodol* stirrer machine with specifications based on operators' body and opinions. The design of the engine reduced the workload rate up to 35% so that operators did not experience fatigue like they did when using manual facilities.

ACKNOWLEDGMENTS

The authors gratefully acknowledge that the present study is supported Talenta DP2M Program of University of Sumatera Utara with Contact Number of 3221/UN5.2.3.2.1/PPM/2017, Date of 24 Juli 2017. The implementation of this program is very beneficial for partners who have collaborated in this program.

REFERENCES

Albert P.C, Heat Stress And Its Impacts On Occupational Health And Performance, Indoor And Built Environment, Vol. 25(1) 3–5 *;* 2016

American Conference of Govermental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exp

ASHRAE Standards, Environment Thermal Conditions For Human Occupancy ASHRAE 55-2004, Atlanta: ASHRAE, Inc.; 2004.

Atiq A.R, Zuly P.R, et. Physiological and Psychological Effects of Heat Stress on Automotive Manufacture Workers, ICGH Conference Proceedings The 1st International Conference on Global Health Volume 2017

Manuaba A & Vanwonthergem K, Improvement of Quality of Life. Determination of Exposure Limits for Physical Strenous Jobs under Tropical Conditions: Final Report-CT-90019. Commission of the European Union; 1996.

Parsons, Ken, Human Thermal Environments: The Effect of Hot, Moderate, and Cold Environment on Human Health, Comfort and Performance, Second Edition, London: Taylor and Francis; 2004

Rasoul Hemmatjo, Investigation of Heat Stress in Workplace For Different Work Groups According To ISO 7243 Standard In Mehr Petrochemical Complex, Assaluyeh, Iran, Journal of Paramedical Sciences (JPS) Vol.4, No.2 ; 2013

Rebekah A, Excessive Occupational Heat Exposure: A Significant Ergonomic Challenge And Health Risk For Current And Future Workers, Extreme Physiology & Medicine ; 2014

Stanton, N et al, Handbook of Human Factors and Ergonomics Method, London: CRC Press; 2005.

Stephen S, Thermal Stress, Human Performance, And Physical Employment Standards, NRC Research Press ; 2016

Guidance of Entrepreneurship and Religious Fields as Supporting the Reproduction Health Promotion Model in Youth Art Organization "Paguyuban X"

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Article Info

Keyword:

Entrepreneurship coaching,
Religious coaching,
Premarital sexuality adolescent,
Health promotion model.

ABSTRACT

Currently the problem that many teenagers experience is the issue of reproductive health. Health promotion model through the art of *Jathilan* modification of adolescent reproductive health cause the average knowledge level of reproductive health of Paguyuban X teenagers better than two comparison groups that are teen group *PIK-KRR* and audiences of art *Jathilan* modified adolescent reproductive health, while the attitude of KRR no difference. The purpose of this research is to know the description of entrepreneurship development before and after guidance in supporting model of promotion of reproduction health in adolescent member Paguyuban X and to know picture of adolescent religiosity before and after done coaching in religious field in supporting model of promotion of adolescent reproductive health in adolescent Paguyuban X. This type of research is experimental research with qualitative approach. To get a model of reproductive health promotion that is tested on teenagers X community through cross-sector of entrepreneurship and religion. The result of this research showed there was in entrepreneurship coaching in adolescents Paguyuban X is not successful in advancing their line of business, due to its desire not to limit employees, because the sense of brotherhood and attachment as a leader to help all peers earn income from joint ventures, with limited capital. In the field of religion in supporting the attitude in the field of reproductive health, especially premarital sex, can be described as a whole that after the guidance in the field of religion, all informants expressed his attitude that has felt an enlightenment to perform worship in accordance with Islamic religion better, not having premarital sex. Three teens have declared doing it in everyday life.

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1. INTRODUCTION

Currently, the problem that many adolescents experienced is the issue of reproductive health. The teenagers in one of the sub-districts in Yogyakarta City in Wirobrajan region have been identified to be at risk of premarital sex. They are included in a youth group, namely Paguyuban X Yogyakarta. One model of health promotion has been done by Djannah (2015) entitled "Art *Jathilan* Modification of Reproductive Health in the Improvement of Knowledge and Attitudes of Teens *Paguyuban X* Yogyakarta".

The results of the research showed that the health promotion model through the art of *Jathilan* modification of reproduction health increased the average level of knowledge of adolescents in *Paguyuban X* who played the roles in the art of *Jathilan* modification, which was higher than the level of knowledge in the two comparison groups, i. e. the group of *PIK-KRR*(adolescent societies in the field of reproductive health)and the group of adolescent audience. Meanwhile, there was not any difference in the attitude of KRR.

Based on the results of FGD (Focus Group Discussion) involving the teenage members *Paguyuban X*, this happened because of the free relationship among those adolescents that had become a habit for them. Thus, according to them, to improve the attitude of the adolescents on reproductive health, they would need continuous activities, both in activities related to *Jathilan* art, as well as cross-sectoral activities, especially in increasing their economic and religious capabilities.

Advantages in the economic field will be able to increase active participation, so that in this research will try to make model of promotion of reproductive health through cross sector in entrepreneurship field. The religious field of the youth of *Paguyuban X* is still low, so the reproductive health promotion model is important, so youth understand the appropriate rules and norms in society.

2. RESEARCH METHOD

This research is an experimental research with qualitative approach. The purpose of this research is to get a model of reproductive health promotion that is tested on teenagers *X* community through cross-sector of entrepreneurship and religion. Subjects in this study were the teenage members *Paguyuban X*. There were a total number of 9 adolescents who were active in the activities of the community as the subjects of the research. The analysis of the data used qualitative descriptive analysis.

3. RESULTS AND ANALYSIS

a. Research result

1). Description of Entrepreneurship Implementation: Distributor of Rice to Teens in *Paguyuban X*Before and After Coaching

The description of the implementation of rice distribution, based on the results of interviews on the Chairman of the association and treasurer is as follows:

> *"....In the beginning, the business went well with five people in the team. Within a month we could buy a pickup car for twelve million rupiah. After we bought the car, some other teenage friends from Paguyuban X wanted to join, so the number of the members increased from five to ten. Finally, there are now 20 people. In the end, our profit decreases and now our capital is not enough to meet the market demand. Now we can only buy half a quintal of rice...."*(Leader of the community and treasurer)

Based on the results of the interviews above about the description of the implementation of rice distribution by teenagers of *Paguyuban X*, it can be concluded that there was a lack of good management in their business. They did not pay attention to the sustainability of their business. The business wasoriented to help their peers. This is in accordance with the results of the following interview:

> *"....Since the leader could not refuse his friend's request, we recruited about twenty teenagers. The four-hundred-thousand profit was used to pay for the wages of our friends. As for our money, we took cash. The long-term cash and the money were reduced and eventually the capital money to buy rice was also reduced. Right now, I can only afford to buy fifty pounds of rice a day ...."*(Leader of the community and the treasurer*)*

2). Guidance of Youth Entrepreneurship in *Paguyuban X*.

There was a lack of good management in their businesses by not paying attention to the sustainability of their businesses where their business was oriented to help their peers. An expert's opinion in the field of economy about the implementation of youth entrepreneurship in Paguyuban X is as follows:

> *"....Their business was trust-based among friends. It did not have a good record and hada lot of cheating gaps. Profits and transactions in business must be records as a consideration for the foreseeable future, not only for a short-term planning...."*(Accounting expert)

The Accounting Expert's advice is as follows:

> *"....My advice is to reduce the number of employees, look for employees who are creative and hardworking. It will be really useful for the human resource progress of their business. A business must be professional. There must be an analysis of the needs of the organization...."*(Accounting experts).

The suggestion from the accounting expert had been delivered to the adolescents in *Paguyuban X*. The teenagers' response about the referral from the accounting expert is as follows:

> *"....The economist does not know anything about our condition. I'm the one who knows a lot. Trust me to manage myself. Please help us with capital. I will try to grow with our friends and we will for progress and prosperity together for the existence of this community...."*(Leader of *Paguyuban X*)

Based on the results of the interviews above, it can be described that the leader of the community does not want to be advised by accounting experts due to his desire not to limit the number of the employees because of his sense of brotherhood and attachment as the coach of the community to earn income from joint ventures. Therefore, the development of entrepreneurship after the coaching through health promotion with cross-sector economy model in adolescent member *Paguyuban X* is declared not successful in advancing entrepreneurship.

3)The Religiosity Description of the Adolescent Members of *Paguyuban X* Before and After Religious Coaching for the appropriate behavior of norms and sexual reproduction.

a) Religiosity of Teenage Members of *Paguyuban X* in General Before Attending Religious Coaching

The description of the adolescents' religiosity, taken from their description of their behavior in worshiping Islam:

1) As for performing the prayers, especially the five obligatory prayers, they did not perform them perfectly (most of them claimed to perform the obligatory prayers only once in a while, as described in the following interview:

> "....*I do not always perform the obligatory prayers for being lazy to wake up or playing with friends...."*(Informant)

2) Committing fasting is mandatory in the month of Ramadan and the adolescents always did it.
3) In doing charity, most teenagers claimed to have done it sometimes
4) In other acts of worship (such as apologizing for faults to others, helping others, and thanking their parents), most of them stated that they always did them. Some deeds were done once in a while, for example talking to parents with a good language and obeying the parents' orders that fit the religious demands.
5) Prohibited activities and religious prohibitions, such as believing in superstitions, eating unclean food (pork, blood, dog meat), drinking alcohol, dealing with adultery, premarital sex, being disrespectful to neighbors, refusing to forgive the mistakes of others, refusing to pay debts, breaking promises, having prolonged hostility, snapping at parents, looking down upon others, and saying bad words were still done by the teenagers.

b) The Description of Teenage Members of *Paguyuban X* in General after Attending Religious Coaching

After attending the coaching in the religious field, the interview results with the teenagers are as follow:

> *"....I feel there is enlightenment, I will fix everything...." (*informant 1*)*

> *"....I feel there is enlightenment. I will fix everything that I rarely do to get close to Allah SWT, like performing prayer and reciting the Qur'an thoroughly. I will correct my wrong behavior...."*(informant 2)

> *"....I feel there is enlightenment. I will be more active again in doing good things...."*(informant 3)

> *"....I feel there is enlightenment. I will teach and be an example for my child so that she/ he can be a pious and diligent son in worshipping. Therefore, I will be more active again in doing good things in religion....."* (informant 4)

Based on the results of the interview, it can be concluded that after the religious couching, all informants expressed that they felt an enlightenment to carry out worship in accordance with Islamic values better.

b. Discussion

1) Coaching in the Field of Entrepreneurship for the Adolescents in *Paguyuban X*

Based on the results of this study, it is known that entrepreneurship coaching for the adolescents in *Paguyuban X* was not successful in advancing their business field. The leader of the community did not want to be advised by the experts, because of his desire not to limit the employees, because of his sense of camaraderie as the leader of the community to help all his peers to earn income from joint ventures with limited capital. Likewise, in entrepreneurship, they did not pay attention to production cost.

This is in line with Pranashakti I (2009), who states that there are some obstacles in business development and small business growth which are more complex than those of big companies at national or international business level. He also describes that there are some constraints experienced by small business in its growth; (1) the inability to balance the potential of production, whether raw materials, tablespoons, operational costs, technical costs, all of which must remain payable, whereas sales can occur erratically. This issue occurred in the entrepreneurship of adolescents in *Paguyuban X*, where they did not take into account the growing number of peers and employees since they could not refuse to accept the additional employees as a fellow community member which led to increased technical and operational costs; (2) high start-up costs for operational costs and initial turnover, whereas there is not any strategy yet. This was also found in the case of youth entrepreneurship of *Paguyuban X* where they exhausted their funds to purchase all the materials and supporters, i. e. pickup trucks; (3) lack of skills. *Paguyuban X* forgot the obvious aspect of recruitment and qualification, because the recruitment was solely based on camaraderie.

2) Coaching in the Field of Religion for the Adolescents in *Paguyuban X*

Based on the results of research on the development of religious fields in supporting the attitude of reproductive health, especially premarital sex, it can be concluded that, after the guidance in the field of religion, all informants expressed that they had received enlightenment to perform worship in accordance with Islamic religion well, as in the case of five pillars of Islam. They performed the mandatory five-time prayers, fasting, charity, or other worship, including avoiding pre-marital sex.

It is in accordance with the expert opinion that the existence of disciplinary awareness to run religious services will bring a change of attitude and behavior of teenagers to be more positive and productive (Willis, 2008). It is because with the order of worship in prayer, they will always remember Allah and His teachings, especially in healthy sexual behavior. Not perform prayers is the cause of some behaviors that are inconsistent with religious values, such as free sex culture and other risky behaviors. This is also in accordance with the results of the study entitled "Religion Relationship with Free Sex Behavior in Youth at SMAN I Bangsal Mojokerto", which concluded that religious understanding is important in reducing premarital sex behavior of adolescents. The statistical results showed that there was a relationship between the level of religion understanding with free sex behavior in adolescents (Aini, 2011).

4. CONCLUSION

1)Entrepreneurship development for the adolescents in *Paguyuban X* was not successful in advancing their business field since the leader of the community did not want to be advised by accounting experts due to his desire not to limit employees. It was because of his sense of camaraderie as the leader of the community who was expected to help all his peers to earn income with limited capital.

2) The promotion of religious affairs in support of attitudes in the field of reproductive health, especially premarital sex, can be considered to be successful. It is because after the coaching in the field of religion, all informants expressed that they received an enlightenment to perform worship in accordance with Islamic religion and values better, as in the case of five pillars of Islam, such as performing the five-time obligatory prayers, fasting, doing charity, and other forms of worship, including avoiding premarital sexual behavior.

b. Suggestion

1) For *Paguyuban X*
   There are some inputs for the leaders of the community, both in the field of entrepreneurship and religion. In the field of entrepreneurship, there mustbe strategies in terms of balancing the potentials of the production, including raw materials, tablespoons, operational costs, technical costs, as well as employee's skills. There must be clear qualifications for the recruitment, because the leader only recruited his peers as the employees without considering their skills. As an input in the religious field, there is a need for disciplinary awareness to practice religious worship. It is because, with the order of worship in the prayer, the teenagers will always remember Allah and His teachings, especially to be committed to healthy sexual behavior.
2) Wirobrajan Local Government of Yogyakarta
   There are some inputs for the local government in coaching teenagers who are at risk, like the adolescents in *Paguyuban X*. In support of the entrepreneurship, there is a need to improve the teenagers' understanding and skills required in entrepreneurship. Therefore, they will have positive activity to do that can help them avoid risky sexual behavior, such as premarital sex. Likewise, religious counseling should be continued so that those who have felt enlightenment after the coaching can always carry out their worship in accordance with the religion of Islam better.

REFERENCES

Aini, L.N., 2011. Hubungan Pemahaman Tingkat Agama (Religiusitas) dengan Perilaku Seks Bebas pada Remaja di SMAN I Bangsal Mojokerto, *Jurnal Keperawatan, Vol. 01, No. 01; Januari 2011 – Desember 2011.*

BKKBN, 2001. *Kumpulan Pedoman Pelaksanaan Program Kesehatan Reproduksi Remaja dan Perlindungan Hak-Hak Reproduksi*. Jakarta : BKKBN.

BKKBN, 2007. *Kurikulum dan Modul Pelatihan Pengelolaan Pusat Informasi dan Consoling kesehatan Reproduksi Remaja (PIK-KRR*). Jakarta : BKKBN.

Depkes RI, 2008, *Program Kesehatan Reproduksi dan Pelayanan Integratif di Tingkat Pelayanan Dasar*, Direktorat Jenderal Kesehatan Masyarakat, Jakarta :Depkes RI.

Direktorat Bina Kesehatan Anak, Direktorat Jenderal Bina Kesehatan Masyarakat, Depkes RI., 2009. *Pedoman Pelayanan Kesehatan Peduli Remaja di Puskesmas*, Jakarta :Depkes RI.

Dinkes, 2012.*Survei Pengetahuan Komprehensif Remaja Umur 15 – 24 tahun tentang HIV/AIDS di Provinsi DIY Tahun 2012: Laporan Tahunan Dinkes Provinsi DIY Tahun 2012*. Yogyakarta :Dinkes DIY

Djannah, S, N., Djatmika, S, D., dan Maryani, H, 2015. *Seni Jathilan Modifikasi KRR dalam Peningkatan Pengetahuan dan Sikap Kesehatan Reproduksi pada Remaja Anggota Paguyuban Turonggo Wiro Budoyo*. Laporan Penelitian Hibah Kemenkes RI, Pusat Pemberdayaan Masyarakat : Surabaya.

Emilia, O, 2011, *Promosi Kesehatan dalam Lingkup Kesehatan Reproduksi*. Yogyakarta :Pustaka Cendekia.

Hurlock, E.B. 2003. *Psikologi Perkembangan :Suatu Pendekatan Sepanjang Rentang Kehidupan (Terjemahan : Istiwijayanti*). Jakarta :Erlangga.

Kementrian Kesehatan Republik Indonesia, 2011. *Promosi Kesehatan di Daerah Bermasalah Kesehatan Panduan bagi Petugas Kesehatan di Puskesmas*., Jakarta :Kemenkes RI

Kumalasari dan Andhyantoro I., 2012, *Kesehatan Reproduksi Untuk Mahasiswa Kebidanan dan Keperawatan*, Jakarta :Penerbit Salemba edika.

Moleong, L, J, 2007. *Metodologi Penelitian Kualitatif*. Bandung :Remaja Rosdakarya.

Pranashakti, I, 2009, *Kewirausahaan dan Strategi Bisnis: 10 Kendala Bisnis Utama Hasil Penelitian*,http://ipan.web.id/kewirausahaan-dan-strategi-bisnis-dan-kewirausahaan-10-kendala-bisnis-utama-menurut-penelitian/, diaksestgl 14 Nopember 2017 jam 02.00 Wib, Yogyakarta).

Seksi Promosi Kesehatan Dinkes Kota Yogyakarta, 2005, *Materi Inti Kesehatan Reproduksi Remaja,*Yogyakarta : Seksi Promosi Kesehatan Dinkes Kota Yogyakarta.

Sunscreen Cream Formula: A Combination of Green Tea Extract (*Camellia sinensis* L) and Dry Extract of Aloe Vera (*Aloe barbadensis Miller*)

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Article Info

Keyword:
Green tea extractcream ,
Aloe barbadensis miller,
Sunscreen

ABSTRACT

Green tea (Camellia sinensis L) contains EGCG which can be effective as sunscreen. On the other hand, the active compounds in Aloe Vera (aloe barbadensis Miller), such as phenolic, ascorbic acid, carotenoids, and anthraquinone, can be used to block UV rays, both UV A and B.Therefore, thereis a need to do a research to find out the influence of Aloe Vera addition in green tea cream preparations against the physical properties of SPF values. The purpose of this research is to know the effects of the addition of Aloe Vera dry extract to physical properties of green tea cream, the SPF cream value of green tea, the stability of cream during a storage period of 8 weeks based on its pH and color parameters. This study is an experimental study. Experimental method is a quantitative research method used to determine the effect of independent variables (treatment / treatment) to the dependent variable (yield) in controlled conditions. Green tea was extracted with the infundation method while Aloe Vera extract was dried using a freeze-dryer. Green tea extract was made into cream with a concentration of 0.2% (Formula I) plus dried extract of aloe vera with the concentration of 1% (Formula II) and 2% (Formula III). After that, the second extract was made into cream as much as 3 formula using the method of smelting. The next cream in physical properties test (pH values, spread ability, adhesivity, pH stability), and the SPF values. The obtained data were analyzed using one way ANOVA and Kruskal Wallis test with a level of confidence of95%.As for the preparation of cream, the obtained pH value were 6.58; 5.46; 5.16 following to formula I, formula II, formula III, adhesivity of 6 second, 2 second, 3 second, spread abilityof 24,58 cm^2, 22,81 cm^2, 21,12 cm^2, SPF value of 3,24; 3,61; 3,69. After that, the stability test for 8 weeks cause changes in pH and color of all formula. It can happen because the active substance has been oxidized. The addition of aloe vera dry extract lowers the pH ($p < 0,05$), decreases the adhesivity ($p < 0,05$), decreases the spread ability ($p < 0,05$) and increases the value of SPF cream ($p < 0,05$).

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1. INTRODUCTION

The exposure of body surface to ultraviolet irradiation produces free radicals in the skin, leading to premature aging and cancer (Jurkovic et al., 2003). Every year, about one million people are diagnosed with skin cancer and about 10,000 die from malignant melanoma. Skin cancer is the most common problem in the body parts that are often exposed to sunlight such as face, neck, head, and back of the hand (Sax, 2000).

Naturally, the skin will try to protect itself from certain conditions to maintain its structure and function. However, under certain conditions the natural protection factor is not sufficient. Therefore, there needs to be an additional non-natural protection, i.e. by providing skin moisturizers and

sunscreen preparations to reduce the adverse effects of sunlight (Wasitaatmadja, 1997).

Green tea has been proven empirically and scientifically efficacious for health with its polyphenol content. Green tea contains EGCG which is identified to contribute about 30% to green tea activity as an antioxidant (Butt and Sultan, 2009). The types of polyphenols present in green tea are epigallocatechingallate (EGCG), epicatechin (EC), epicatechingallate (ECG), epigallocatechin (EGC) (Butt and Sultan, 2009). High antioxidant activity in green tea is beneficial to protect the body from oxidative damage caused by free radicals. It is believed that antioxidants can slow or stop cancer initiation, heart disease, suppress immune function, and aging (Miller, 2001). Based on a research conducted by Vayalil et al. (2003), it is found that epigallocatechingallate cream formulation with hydrophilic base can prevent the occurrence of skin cancer in mice induced by UVB.

However, there are still some obstacles regarding the stability of green tea. Therefore, to improve the stability and value of SPF green tea, another ingredient is needed. One of medicinal plants that can be used is aloe vera extract. Medicinal plants from the lily family (Liliaceae), the aloe vera genus, have been used for the treatment of skin diseases for over 2,000 years (Dal'Belo et al., 2006). Aloe vera gel is widely used in cosmetics to moisturize, revitalize the skin, and even block UVA and UVB rays, and maintain a balance of skin's natural moisture (Goswami et al.,2013).

Based on a study by Proserpi (1976), it is found that cosmetics containing 1% to 2% aloe extract provide effective sun protection by selectively screening UV radiation by absorbing erythemogenic rays. Based on this, the researchers did orientation by making sunscreen cream with the concentration of 1% and 2%.

In order for the use of antioxidant benefits of green tea and aloe vera to wider community, it is necessary to develop an appropriate dosage form. Cream is a semisolid dosage form of an emulsion containing one or more dissolved or dispersed ingredients in an appropriate base material (containing water not less than 60%) (Syamsuni, 2006). It is easier for cream to spread evenly and in the case of cream in oil type emulsion in water, it is easier for it to clean than most ointments (Ansel, 1989). Based on this, the researchers develop sun screen cream from the fraction of ethyl acetate green tea infusion with the addition of dry extract of aloe vera in the form of cream preparations.

2. RESEARCH METHOD

Method

The type of design used in the study is experimental. Experimental method is a quantitative research method used to determine the effect of independent variables to the dependent variables (yield) in controlled conditions. Conditions are controlled so that no other variables (other than treatment variables) affect the dependent variables (Sugiyono, 2013).

The variation in this study is the content of aloe vera extract added to green tea cream. The variables in this study are physical properties of the cream, i.e. organoleptic properties, pH, spreading, adhesion, physical stability, and SPF value. The controlled variables in this study are the solvent used, the test method, the storage temperature, and the cream making process.

Materials

The study began in March. The materials used were green tea leaves obtained from PT Pagilaran Yogyakarta, aloe vera leaves obtained from Gamping Yogyakarta, the ingredients of the cream with the degree of pharmaceutics are: stearic acid, cetyl alcohol, stearyl alcohol, triethanolamine, glycerin, citric acid, methyl paraben, oleic acid, propylene glycol, *temulawak* essential oil, tween 80, span 80, vitamin C, and water. The research was conducted at FTS Laboratory of Ahmad Dahlan University.

Research Procedure

1. Epigallocatechingallate extraction from green tea
   Epigallocatechingallate in tea leaf simplicia was extracted with reference to Row and Jin (2006). Firstly, the simplest was infundated for 15 minutes with aquades. The infusa was then filtered and the filtrate was then thickened by evaporating it over the waterbath. After that, the infusa was fractionated with ethyl acetate 3 times. The ethylacetate fraction was then thickened with a rotary evaporator. After it was thick, then it was evaporated in the water bath until ethyl acetate was exhausted to obtain dry powder green tea extract. The EGCG levels in a dry extract were determined by the High Performance Liquid Chromatography (HPLC) method.
2. Green tea extract cream making

Once the extract was obtained, then the next step was the formulation in cream. The formulation of green tea extract cream with the addition of antioxidants is presented in Table I.

Table I. Green Tea Cream Extract Formula with the Addition of Aloe Vera Extract

Materials	F I	F II	F III
Green tea extract	0.2	0.2	0.2
Stearic acid	5.14	5.14	5.14
Setyl alcohol	2.75	2.75	2.75
Stearic alcohol	5.14	5.14	5.14
Triethanolamine	1.28	1.28	1.28
Glycerin	7.72	7.72	7.72
Citric acid	0.64	0.64	0.64
Methyl paraben	0.25	0.25	0.25
Oleic acid	6.04	6.04	6.04
Propylene glycol	7.17	7.17	7.17
Temulawak essential oil	6.79	6.79	6.79
Tween 80	10	10	10
Span 80	1	1	1
Vitamin C	1	1	1
Aloe vera dry extract	-	0.5	1
Water	Ad 100	Ad 100	Ad 100

Information:
FI: Green tea extract cream formula
FII: Green tea extract cream formula with the addition of dry exfoliation aloe 1% FIII: green tea extract cream formula with the addition of dry extract of aloe vera 2%

The method for making cream is as follows: oil-soluble ingredients like stearic acid, cetyl alcohol, stearyl alcohol, citric acid, Span 80 and oleic acid melted at 75°C. Similarly, water-soluble ingredients are Vitamin C, triethanolamine, glycerin, methyl paraben Tween 80 and propylene glycol were also melted at the same temperature. After that the two mixtures were stirred until they aerehomogeneous. Last, the essential oil of ginger, green tea extract, aloe veraextract or papaya fruit extract were added.

The cream was then divided into groups and directly evaluated for its physical properties, SPF, and hydrotherine effect, and a cream was stored for 1, 2, and 3 months which furthermore its physical properties was evaluated.

3. Evaluation on the physical properties of the cream
   a. Organoleptic and pH determination
      Organoleptic preparations to define are such as the shape, color, odor,

consistency, and cream pH. Organoleptically, a cream preparation with a hydrophilic base should be semi-solid in color white or colorless, odorless, and soft in texture. The measurement of cream pH was done using pHmeter.

b. Scattertest
Half a gram of cream was placed on a spherical glass round then it was covered by using a rounded glass that has been weighed for 5 minutes and the diameter of its spread was recorded. Then, 50 grams of it was loaded for 1 minute then the diameter of the spreading was recorded. Replication is done 5 times. The same test was performed for all creams (Voigt, 1984)

c. Determination of viscosity
The preparation to determine viscosity was done using the Stormerviscosimeter. A number of preparations were inserted into the viscosimeter cup and then the apparatus was run after weight-bearing. After the load was released, the viscosimeter would rotate and then its rpm was recorded. Viscosity was determined after a curve of the relationship between the load with rpm.

d. Physical stability test
The preparation was centrifuged at 3000 rpm for 30 minutes. After that, the volume of oil phase that formed was calculated.

e. Chemical stability test
The preparation was determined by EGCG content by using High Performance Liquid Chromatography under the following conditions: mixed toluene mixed phase: acetone: formic acid in the ratio of 5: 6: 1; wavelength 282 nm; motion flow rate 1ml / min and using column C 18.

4. SPF Value Determination
The value of SPF cream was set referring to Bambal et al. (2011). A total of 1 gram of sample was included in Erlenmeyer and ethanol up to 100 ml was added. After ultra sonication for 5 minutes, then the mixture was filtered. A total of 10 ml of first filtrate was discarded. Furthermore, filtrate was taken as much as 5 ml and ethanol up to 50 ml was added. 5 ml solution was taken and 25 ml ethanol was added. The solution was then readable uptake at a wavelength of 290-320 nm with a wavelength interval of 5 nm. SPF values were set by the following formula:

5. Determination of skin water content
The moisture content in the stratum corneum was determined using the Corneometer tool. A total of 10 mg of cream smeared on the area of 2 cm2 on the probandus forearm for 6 weeks. Moisture measurements were performed after 1, 2 and 6 weeks of application.

Data Analysis

The data obtained were then analyzed using one way Anova to know the significant difference between the formula with 95% confidence level. The research procedure was to make cream from green tea extract and aloe vera extract and then the obtained cream was first tested for its physical characteristic, i.e. organoleptic and pH test, spreading test, sticky test, physical stability test. Then the cream was tested for its SPF value by using a spectrophotometer at a wavelength of 290-320nm.

$$SPF_{spectrophotometric} = CF \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda)$$

Information:
CF = Correction factor (10)
EE = The effect of eryemal spectra
I = Spectrum of intensity
Abs = Absorbance of sample solution

3. RESULTS AND ANALYSIS

Based on the third evaluation of the cream, it was found that the properties of cream was in thick and dilute form, white, and the typical odor was obtained from the essential oil of *temulawak* oil. The purpose of *temulawak* essential oil addition was to improve the penetration ability of EGCG compound in passing through the skin. This is because the delivery of EGCG through the skin was still not optimal. The nature of EGCG is easy to oxidize so that it can decrease its activity (Hsu, 2005).

To increase the penetration ability into the skin layer, an enhancer was added, i.e. volatile oil of *temulawak* combined with oleic acid and propylene glycol. Each enhancer has its own mechanism in helping the active substances enter the skin layer so that with this combination, it is expected that the EGCG penetration will be maximal (Sugihartini et al., 2011).

1. Spreading Power Test

The purpose of testing the spread of the cream is to determine the ability of cream preparations in spreading on the skin surface. A large cream-sprinkling cream preparation suggests that the cream preparations are capable of spreading on the skin surface rapidly without excessive emphasis. With the presence of cream preparations with a large spreading power, it is expected that the contact area between the active substances with the skin is greater so that the optimal effect will be obtained. The data of spread power test result can be seen in table II

Table II. Test Result on the Spreading Energy of the Cream

Cream	Without Load		Load 50 gram	
	Radius $\bar{x}$ ± SD (cm)	Length $\bar{x}$ ± SD (cm^2)	Radius $\bar{x}$ ± SD (cm)	Length $\bar{x}$ ± SD (cm^2)
Formula I	2.66 ± 0.04	22.25 ± 0.74	2.80 ± 0.06	24.58 ± 1.00
Formula II	2.54 ± 0.04	20.23 ± 0.77	2.69 ± 0.02	22.81 ± 0.54
Formula III	2.43 ± 0.05	18.54 ± 0.83	2.60 ± 0.04	21.12 ± 0.55

Based on the table above, it can be concluded that with the addition of aloe vera dry extract, the spread of cream is reduced. It can be seen from the value of the scattering power extent decreases with the addition of aloe vera dry extract. After the test with one way anova statistical analysis, it can be concluded that the difference of power spreads value significantly occurred in all groups of formulas.

2. Sticky Power Test

The purpose of adhesive power test is to determine the ability of the cream in adhering to the skin surface when used. The longer the adhesive power of a cream preparation, the longer the active substance contact with the surface of the skin so that more active ingredient is absorbed by the skin. Thus, it is expected that it can provide maximum protection on the skin. The sticky strength test of the cream is performed after the preparation of the cream at room temperature.

Table III. The Result Data of Sticking Power Test of the Cream

Formula	$\bar{x}$ ± SD(detik)
Formula I	6 ± 0,71

Formula II	2 ± 0,71
Formula III	3 ± 1,00

The data show that with the addition of aloe vera dry extract, the stickiness of creamis reduced. It can becaused by cream consistency added with dried extract of aloe vera which becomes more slippery because the dry extract of aloe vera mixed in cream back to its initial form which is slimy. It causes the reduced ability of the cream to stick.

On one way anova test, the significance value of 0,000 was obtained which means that there is a significant difference. After that, a post hoc analysis is conducted. By looking at the result of post hoc analysis, it is found that the significance value of formula I and formula I with formula III is 0.000, significance value < α (0,05) so it can be concluded that the addition of aloe vera dry extract tends to decrease adhesion. In the case of formula II with III, the significance value is 0.077 means > α (0,05). Therefore, it can be concluded that among these formulas, there is no significant difference regarding the value ofadhesion.

3. Physical Stability Test

The physical stability test of this cream preparation was carried out at room temperature for 8 weeks. Then, in the evaluation of each week includes organoleptic tests such as discoloration and pH value testing. Observations were performed at week 1, 4, 6, and 8. The physical stability test data obtained were as follows.

Table IV. Data of Physical Stability of Cream Preparation based on Color Change Parameters

Week	Formula I	Formula II	Formula III
0	White	White	White
1	White	White	White
4	Custard	Brown	Brown
6	Brown	Dark Brown	Dark Brown
8	Dark Brown	Dark Brown	Dark Brown

The data above show that the three formulas begin to change color at week 4. This can be due to the fact that green tea extract or aloe vera experience oxidation reaction. Drastic change in cream color occurs at the 6th week, from brown to dark brown. It can be concluded that if more concentration of dried aloe vera extract is added, then the resulting cream preparation is also more acidic. The acidic pH values can also affect the acidity of the cream preparations.TheaveragepHvalueisstillincludedinthepHrangethatdoesnotirritatetheskin (normal), so the preparation is safe to use. The pH requirements for a topical preparation, usually the same as the pH of the skin, are between 4.5-7 (Wasitaatmaja, 1997).

This pH test is one of the tests to be conduct on a topical preparation, because the pHvalue can affect the stability and comfort of the users. Based on observations of pH values on each formula each week, it was shown that the pH tended to decrease. The decrease in pH value in formula II and formula III might be due to the phenol content in the aloe vera gel undergoing oxidation reaction to produce aloetic acid and chrysophyllic acid (Padmadisastra et al., 2003). In addition, based on the quality standards set by Terry Laboratories, the UnitedStatesmentioned the value of pH of Aloe vera dry extract range from 3.5-5.0 (Furnawanthi, 2002).

In the formula III, the pH value also decreased in every week which can be caused by the content of EGCG presenting in green tea experience oxidation reaction. In addition, the decrease of pH value in a cream preparation can also be caused by CO_2 entering the container and CO_2 gas reacting with water to form H_2CO_3 to decrease the pH of the preparation. However, this pH value

still enters a safe topical pH range. After being tested using one way anova, it can be concluded that there are different significant pH values in week1, 4,and 6 for all groups of formulas, i.e. between formula I with formula II, formula I with formula III, and formula II with III.

At the 8th week, based on the existing statistical analysis, it can be concluded that the data is normally distributed and the variance is not the same, followed by wallist cruciate test. In this test, it can be concluded that there is a difference of pH value at the 8th week between all formulas, i.e. between formula I with formula II, formula I with formula III, and formula II with III. Based on the results of pH stability test, it can be concluded that there has been a change of pH in all formulas for 8 weeks storage.

4. CONCLUSION

The addition of aloe vera dry extract on cream extract of ethyl acetate fraction of green tea can decrease the adhesion, spreading, and pH value of green tea cream. The addition of aloe vera dry extract concentration can cause the increasing value of SPF green tea cream extract. During the 8 weeks storage, all formulas change color and pH value.

ACKNOWLEDGEMENTS

This research was conducted with the funding support from UAD Research and Development institute in 2015.

REFERENCES

Ansel, H.C., 1989, *Pengantar Bentuk Sediaan Farmasi*, 515, Universitas Indonesia, Jakarta. Butt, M.S and Sultan, M.T., 2009, Green Tea: Nature's Defense against Malignancies, *Critical Reviews in Food Science and Nutrition*, 49:463–473

Dal' Belo, S.E., Gaspar, L.R., Campos, P.M.B.G.M., 2006, Moisturizing Effect of Cosmetic Formulation Containing Aloe Vera Extract In Different Concentration Assessed By Skin Bioengineering Techniques, *Skin Research And Technology.*

Furnawanthi, I., 2002, *Khasiat dan Manfaat Lidah Buaya*, hal 5,6, 7, 8, 9, 10, 15, 19, 20, 43, 44 AgromediaPustaka, Jakarta.

Goswami, P.K., Samant, M., Srivastava, R., 2013, Natural Sunscreen Agents: A Review, *Scholars Academic Journal of Pharmacy*, 2(6):458-463.Hsu, S., 2005, Green Tea and The Skin, *Journal American Academy of Dermatology*, 52:1049-59

Jurkovic, P., Sentjurc, M., Gasperlin, M., Kistl, J., Pecar, S., 2003, Skin protection Against Ultraviolet Induced Free Radicals with Ascorbyl Palmitatein Microemulsions, *European Journal of Pharmaceutics and Biopharmaceutics*, 59–66.

Miller, J.M.T.H., 2001, Anticarcinogenic Properties of Green Tea (*Camellia sinensi*) *Journal Of Medical Microbiology*, 50: 299-302.

Padmadisastra, Y., Sidik.,Ajizah, S., 2003, FormulasiSediaanCair Gel LidahBuaya*(Aloe vera*Linn.) sebagaiMinumanKesehatan, *SimposiumNasional Kimia BahanAlam III*, Bandung.

Row, K., and Jin, Y., 2006, Recovery of Cathecin Compound From Korean Tea by Solvent Extraction, *Bioresource Technology*, **97**, 790–793

Sax, B.W., 2000, Educating Consumers About Sun Protection, *Pharm. Times*, New York, 66(5), 48-50.

Sugihartini, N., Fudholi, A., Pramono, S danSismindari, 2011, Optimation Composition of Oleic acid, Propylene glycol and Volatile Oil of *Curcuma xanthorrhiza*as Enhancer of Transport of Epigaalocathecingallat in Green Tea Extract with *Simplex Lattice Design Method*, *JurnalBahanAlam Indonesia*, 7(7)393-395.

Syamsuni, H.A., 2006, *IlmuResep*, 74, EGC, Jakarta.

Vayalil, P.K., Elmets, C.A., and Katiyar, S.K., 2003, Treatment of green tea polyphenols in hydrophilic cream prevents UVB-induced oxidation of lipids and proteins, depletion of antioxidant enzymes and phosphorylation of MAPK proteins in SKH-1 hairless mouse skin, *Carcinogenesis*, 24(5),927-936.

Wasitaatmadja, S.M., 1997, *PenuntunIlmuKosmetikMedik*, 3-5, Jakarta, UI Press.

Yavari, Z., Moradi, H., Sadeghi, H., Golchini, B.B., 2013, Evaluation of Aloe vera (*Aloe barbadensis Miller*) Antioxidant Activity and Some of the Morphological Characteristics in Different Vermicompost Field, *Journal of Chemical Health Risks* 3(4):19-28.

The Meaning of Work and Their Relationship in the Family: Case Study in Woman Food Home Industry Workers in Malang

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Article Info

Keyword:

Double Responsibility,
Meaning of work,
Motivation to work,
Position in decision-making.

ABSTRACT

Working is a form of people's effort to survive. Woman home industry worker is both a family member and as a mother who had double responsibility toward her family: in on one side they had to uphold their main role as a mother who must be able to handle all of the household tasks as well as reproductive work, yet on the other side they had to bear the burden of a productive job as an effort to help to improve their family's wealth. This study aimed to describe about women home industry workers in the city of Malang in viewing their meaning of work, choice of work type, motivation to work and the relationship in their family. This research used a qualitative Case Study approach with in depth interview and participatory observation as the data collection methods. A qualitative descriptive analysis was performed to analyze the overall data. Result showed that woman workers, in their meaning of work are more oriented toward the effort of fulfilling the economic demands. That had also been the women's motivation to work. Positive support and balance shared household responsibilities in the family gives a chance for these women to have an economic role. Women's position in decision-making inside the family is determined by their economic contribution. Flexibility and relation-based work pattern of home industry was driven by traditional work style, and that made it relatively an ideal job opportunity for women's productive role.

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1. INTRODUCTION

The phenomenon of women who work is generally because of the increased women's active role in economic activities that can be seen in their involvement in various types of jobs. Work activity is a form of effort that, for women living in Java, especially in rural areas, has been done for a long time and has become a strategy to survive (Hull, 1976). Nowadays, women are working hard to come out from their miserable situation. Women are compelled to make a living generally because of the economic demands of the household and the insufficient husband's income to meet the needs of the ever-increasing family demand while the income is not always increasing (Moelyoto, dkk in Asyiek, dkk, 1994:8).Therefore, the responsibility to make a living will be more prominent among women from disadvantaged families, which causes a boost for economic demand of the households. Thus, the phenomenon of women who are involved in making a living is not only a prevalent but also a must. The women entrepreneurs interviewed for this study indicate that they have had many problems to overcome in establishing their businesses. Some of these are common to all entrepreneurs and some are specific to women. They have been responsible for both the internal and external affairs of their families (Makararavy,*et al*, 2009). Small and medium enterprises are such a business where women can start their business easily with a small amount of money. It helps them to be economically empowered, which is essential to ensure women's social and political empowerment. An SME woman entrepreneur can contribute much, not only for their family, but also for the country through

participating in various social and political activities as well as generate employment for the people (Khatun&Kabir,2014)

Poverty is the cause why women from this category did not simply hand over the household responsibility to their husbands. They consider the family economy as a shared responsibility.Such fact shows that women are not acting passive and give in to fate, as they are trying to overcome all the difficulties, challenges, pressure and economic pressure with a survival strategy by doing productive activities to achieve the fulfillment of family needs.

An effort done to get a job for a woman who has a family is not easy. Many limitations for women, such as low education, low skills, insufficient work experience, and the presence or absence of employment opportunities due to the expected ideal role of women as housewives who are faced with their duties to manage and coordinate all activities of the household. These barriers are the cause of an imbalance by gender (*gender inequality*) in employment, such as the presence of different wages for equal work and segregation (separation) employment by gender (Siswidiyanto, 1998:22). Swasono (2009:2) also states that one of the causes of women's poverty is the presence of a *patriarchal culture* that leads to structural imbalances, so that women will be limited to education, economic access, and organization. Factors in the resistance are what ultimately lead women to accept the job as it is in accordance with the conditions that exist in the middle of a very limited choice, like choosing a job near to home and even willing to accept low wages. These conditions demand the flexibility of space and time to do both domestic chores and the production that can provide income while not escaping the responsibility for domestic work (Schiller, 1978).

The participation of women in economic activity increased as the increasing number of women working outside the household and the amount of work that can be penetrated by women, like many women jobs as small traders, factory workers, farm laborers and crafts become a source of income that will affect the economic level of the household (Sahara, 2000:1). Increased participation of women in the work is expected to affect the welfare of the woman herself and her family, because with more and more women workers entering the labor market, it means there is a higher quality of life for women and their families.

Asyiek, Syahri and Molo (1994) found that women in this work activity might also find financial freedom and more independencewhere they were able to contribute to their household income, not only depended on the husband, and were even able to replace the function of the husband as the main breadwinner. *De Quelyoe,Asnawi and Molo* (1994), also found domestic industry to be a place for women to work productively and contribute to the household income so it was a vehicle to maintain *survival* in the economic life of the family. *Wendy Liana* (2002) found that the number of dependents, the amount of income the husband and area of residence affect the amount of time spent at work, and ultimately affect the female labor force participation. Siswidiyanto, et al (1998) found that the reasons for women's work were driven more by the family's economic pressure. They generally used the entire wage to meet family needs in case of women working outside the home. Regardless of their position and their economic contribution, their main task remained the household. The urge to get out of poverty requires' active role' and' responsibility' of all family members, especially women as mothers who also have a considerably large active role not only in the domestic sector (in house) alone but also play a role in the public sector (outdoors) in which requires a flexible time management in doing both.

In Malang, there are a lot of processed food household industries which employ women. Besides those industries have a unique pattern of industrial growth, which largely is supported by industry sector of small and micro industries, such as Tempe Industry and Tempe Chips as well as Food and Beverage Industry and crafting industry. The research was conducted in an effort to comprehensively reveal the presence of women domestic processed food industry worker in the city of Malang in their empowerment process through the disclosure on the deeper meaning of their internal and external conditions in a variety of activities, which was aimed to obtain a clearer description and depth about women who could serve the economy by working to contribute to prosperity and economic welfare of families in the middle of the constraints that they had.

2. RESEARCH METHOD

Some quite complex problems experienced by female domestic workers in processed food industry in the city of Malang raise some interesting questions to be studied and explored more deeply through this research. Therefore, this research aims to uncover the issues more deeply and explore the phenomenon of social and economic life of female workers in the city of Malang. To be able to uncover the problems, this study used a qualitative research with a case study approach with *qualitative verification design* (Bungin, 2008) to know the phenomenon of female domestic

workers in a real industrial life. Meaning analysis that took place at interaction level was done to understand why they had certain patterns of action. Thus, there needed to be an intensive observation which was only possible through a qualitative research approach. Qualitative research methodology is a procedure that produces descriptive data in the form of written or spoken words from people and their behaviors that can be observed.

3. RESULTS AND ANALYSIS

This study resulted in the discovery from in-depth study of the interview results with working women, which were divided into several themes, namely the meaning of work and the choice of work type, motivation to work, division of roles and cooperation in the family, time allocation of woman in work, and the position of women in family decision-making. The majority of the working women were between 20 to 50 years old (86.7%) and 13.3% were 51 to 60 years old. More than 80.0% were married, 13.3% were single, and 6.7% were divorced. They had 2 to 5 children, and had a work experience of 3 to 6 years. The women in this study were less educated than average, with 6.7% having a Diploma degree, 33.3% having a Senior High School education, 46.7% having a Junior High School education and only 13.3 % having Elementary School education.

3.1. Meaning of Work and Choice of Work Type

Meaning of work from the view of the working women is generally expressed as an attempt to *'pados rejeki'* (look for money). Its implicit meaning is that the meaning of work for them is based more on economic demands and attempts to survive since if they do not work they cannot continue living, while hoping that the work carried out would lead to a better state than the previous one. Working is aimed more to pursue matter. For female workers, it is a real phenomenon that cannot be denied by those who see life to be very difficult, especially when they have to bear children while the husband's income has not been able to provide for the family. It becomes one of the main reasons why these mothers want to help and be engaged in the search for extra income.

But some women said that working was actually a form of utilizing health given by God, so it was rather based on belief in their religion. The meaning of work for them was in line with the meaning of worship. According to them, people who believed in the guidance of their religion had to do their worship and obey the rules of their religion. Implicitly, this leads to a conclusion that an *'obligation'* to work is identical with that obligation that should not be left behind by people.

Various options of work at home industry sector are taken by female workers due to several reasons, such as the ease to get raw materials, the ease of doing a dual role, and the ease of doing it because of the required skills to do them are those that have been previously owned. Selecting the work to process raw cassava into chips seemed to be the best option according to one of the woman workers, arguing that the work was easier to do because of the availability of many raw materials in all seasons and could be obtained easily from cassava sellers. On the other hand, some of the female workers chose to be a *crispy tempe* wrapper as a productive activity. This type of work was mostly chosen by women who had children who were still a toddler and needed parental supervision. They could not leave their children by working outside their houses. Thus, by selecting a job in the informal sector, i. e. home industry that has a traditional system and work rules which is also flexible, simple, and allows you to work while carrying your children, provided that the work can be done well, is the best option for those female workers. For working mothers, especially those that cannot entrust their children to another person or family to take care of their toddler, this kind of job is ideal. From the results of the interview, many female workers chose to make traditional snacks from cassava because the required skills to make them had been taught from their family for generations.

Women who do productive activities at home are viewed differently by the society that originally thinks that all women need to do is work at home to do household tasks. The view is now shifted as many women work to earn a living. In choosing the type of work suitable for them, women respond to their conditions which are biologically different from men.

The general view about the type of work suitable for women is the one that does not require women to work too hard by dealing with heavy objects and the one that is risky because, after all, women have biologically different physical capacity from that of men. Since originally the works that women need to do are to take care of their children and do domestic works such as cooking, washing, cleaning the house, and all other household chores, it can be interpreted that the work suitable for women's condition is domestic work. Even if women must go out to earn a living to fulfill the needs of the family, they should be able to manage their time. Therefore, they must prioritize to do household work before the work in the public sector outside of home.

From the explanation of the women's views on the type of work that suits women, it can be interpreted that the work for women should be the one that does not exert too much strength or physical energy, since physically women are considered weaker than men physically. Jobs that are less risky are also recommended for women given that they still have responsibility to take care of their children, hence the woman's work should be actually a work at home. If they really need to work in order to hold the family's economy then they must take a job that enables them to manage their time in order for them to be able to prioritize their household affairs.

3.2. Motivation to Work

Motivation refers to things that encourage individuals to make decisions, act and behave in response to the situation in the neighborhood. Each person must have a certain expectations or motives when deciding to do something, and if his/ her expectations can be achieved then it will give satisfaction to him/ her. Satisfaction is a motive that encourages individuals to do something, including the decision to work. To achieve the motive or purpose, the individual will show some behavior or do some activities. In this study, it was found that there were differences of women motivation in their decision to work. The most dominant reason was the lack of family income because of insufficient husband's income, or the husband's inability to work anymore. As a result, to meet the family needs, they needed to work, either inside or outside their home to help her husband in supporting the family needs. Another reason was to fulfill their hobbies and leisure time, to get income in order to get more freedom in their private consumption, or to reduce dependency on their parents.

The reason which was commonly found was the economic inability of their family if they relied solely on the husband's income or were only dependent on the husband's role as the main breadwinner in a family. Such condition once again was what mainly forced them to work even harder in their life to sustain the family economy as a role usually performed by their husbands. The hard life in the city caused the inevitably high economic demands. They were already used to the conditions since, as a child, they used to help their parents to cook, sweep the floor, do the laundry, wash the dishes and other households chores. Rather than based on a compulsion, those women worked because of their own willingness and sincerity without being ordered by their husband. Everything was based on their sincerity and moral responsibility to address common problems in their household.

3.3. Division of Roles and Cooperation in the Family

In a family consisting of the head of the household and family members, traditionally there must have been a division of roles among family members, be it the husband, wife, children in the nuclear family, or even parents, uncle, aunt and others in the extended family. Psychologically, living together in the same family in a shared dwelling, there must be an inner linkage that occurs between the members that affects each other.

Each family member must have their own ability and expertise, duties and different roles at home in doing household activities. Family roles describe a set of interpersonal behavior, nature, and activities associated with the position and personal circumstances. Personal role in the family is based on the expectations and behavior patterns of families, groups, and communities. As a wife and mother of her children, a mother has a role to take care of the household, as a caregiver, educator, and be protective of her children. She also needs to play her social role as well as being a community member of her community. In addition to it, the mother may also play a role as an additional breadwinner of the family. The division of roles and responsibilities in carrying out the work in the household shows that women, in performing household chores, do not carry everything out alone.

Division of roles among family members is a common thing in domestic life of women workers. However, such division is not really clear, because it is very dependent on the one who has free time and is able to do the job. This suggests the role equality among family members in managing the household affairs. This phenomenon indicates the existence of togetherness as a family, making the family members appear to be partially responsible for the economic sustainability of the family.

The involvement of women as workers in helping family's economy will not be realized if the family members such as husbands, parents and their children do not provide opportunities and support by playing the roles they are assigned to. Family support, more importantly from the husband, can motivate women in doing their job. Support can be in moral and material forms, for example in the forms of trust and assistance to do the job.

The findings of this study may be a reference to understanding the meaning of family support for female workers in providing the opportunity for them to be able to work as additional breadwinner. The family support meaning can be observed in certain forms that come from husbands,

parents or children who provide physical and psychological assistance. Some husbands could be quite supportive in which they gave permission to their wives to have a job as long as they prioritize household work and were responsible as a mother who had to take care of her children, which could mean a lot for female workers. Meanwhile, some husbands were very supportive by giving assistance in expanding their wives' business market. However, there were also some cases where the female workers were given a very little moral support and assistance to work on the dual role of a wife and an additional breadwinner because the husband could not help his wife doing the work at home as the husband also worked outside of home.

3.4. Time Allocation of Women at Work

Work and family are an important part in a human life. Even though both seem to be two separate things but it cannot be denied that they are mutually exclusive. For a woman who is generally in charge of the work in family circle, when she must also work to sustain the family economic condition, she will need to put an extra effort to balance out these two activities. It means that women should be able to wisely divide their time or allocate their time for the two activities.

The existence of time-sharing efforts in carrying out household chores and non-household work indicates the fact that female workers should be able to manage their time between the various dense activities that they should do. While conducting the interviews with the respondents, it was found that female workers devote more of their time to work in the domestic household sector than to do productive work that makes more money or income. On the other hand, some also stated that they had very little free time to rest because when it was actually a break time, they still needed to carry out their household chores or side jobs for extra income.

Conceptually, their time during the day was allocated into various activities, such as working in the labor market (where they directly made money or where there was a market value), doing the activities in the house (which was considered to have no market value), and having leisure activities (rest time after working at work and at home), including leisure, personal, and social time. The allocation of time for the 24 hours within a day is as follow: about 6-10 hours to do non-household job to gain income and 14-18 hours for a variety of activities including household activities, social activities as well as leisure activities and other personal activities, such as worshiping and having restful sleep. Household activities include shopping, cooking, doing the laundry, cleaning the house (like sweeping and mopping floor and cleaning the yard),picking up the laundry, and taking care of the children. On the other hand, the income-generating activities are activities carried out as a non-domestic work such as frying chips, wrapping, adding seasoning, grating sweet potatoes, printing, giving label, etc. All of which can generate revenue. Social activity is an activity to attend various celebrations, like marriage, circumcision ceremony, as well as social gathering, and organizational activities such as PKK and Islamic recitation event. As for leisure activities, they are activities that give a recreational feeling, such as watching TV, listening to radio, reading newspapers or magazines, chatting with friends and other personal activities, such as taking a bath or sleeping.

The findings of this study showed that the activity for a living was generally performed after the house chores were done. However, after doing the income-generating activities, female workers still needed to do more household activities, or even did both at the same time (known as *nyambi* in Javanese). Female workers who had a toddler often went to work with their children. However, when there was someone at home to help taking care of the children, then the female woman could divide the time between working to make a living and being at home, since the children were left with other family members who could be trusted such as the husband or parents. It can be interpreted that female workers spend much time doing household activities and have a very little free time to rest because they need to do the household works such as waiting for their children while they are studying and taking care of them. Furthermore, they even need to work to supplement the family income.

Figure 1: Women who bring their children while working

3.5. The Position of Women in Family Decision-Making

Family environment, either core family or extended family, will influence the decision-making process. The Java community that embraces *patrilineal* lineage pattern, customs of the father's family is very influential. Father as the head of the family is the one who determines everything, including the control of economic resources of the family.

The phenomenon of the role of working women in decision making in a family can be observed from results of the research. It can be concluded that the role of family decision-making for the wife or the mother is a proportionally balanced in decision making as well as in commitment. It was observed that every decision dealing with house keeping jobs, such as determining meal choice, home furnishings, furniture, and others that are related to the maintenance of the children are in the wife's or the mother's hand. Besides, all decisions which are 'non-domestic' and are at greater risk will likely be in the hand of the husband. This situation is actually influenced more by economic role factor, so working women will have greater role compared to those who do not work. Thus, it can be concluded that the position of women in family decision-making is largely determined by the size of their economic contribution to the family.

Various statements from the research representing how women workers interpret the meaning of work, the work type choice, motivation to work, division of roles and cooperation in the family, time allocation at work, and the position of women in family decision-making are described in the following scheme:

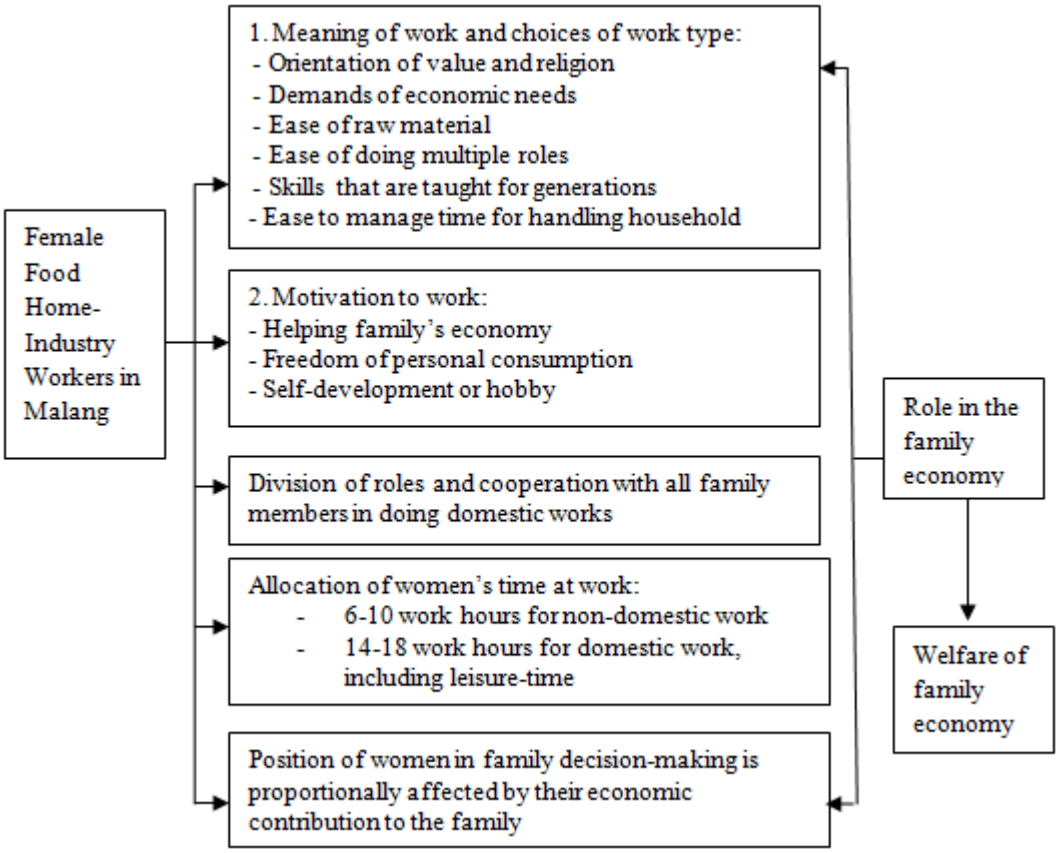

Figure 2: Schematic of women's view about the meaning of work and its relation with family

4. Conclusion

Based on the exposure, the data analysis and discussion that have been presented in this study, the conclusions of this study represent the female workers' view on the meaning of work based on religious values and beliefs that work is an attempt to fill the life obligation to worship God because humans are creatures of God.

The best selection of jobs for women workers, according to them, should be in accordance with women condition which is physically limited. Therefore, they generally tend to choose jobs based on the ease of work, the flexibility of time and work rules to fulfill their dual roles, their skill capacity and availability of production source. Their views on the appropriate types of work for women are still influenced by gender ideology that physically distinguishes women from men. Their view on the suitable jobs for them are the one that does not require them to work too hard and is risky, especially those that provide convenience in order for them to able to manage their time at working and taking care of the household.

The women motivation to work is mostly to optimize their self-potential and to be self-contained primarily due to the economic physiological, and social needs as well as for self-actualization.

Balanced positive support and cooperation among family members are important for female workers. It is because, while prioritizing their household work, female workers need to be supported with a work system within the family to together do housework chores. This balance can be achieved when there is an existence of strong ties within the family members and equal role for all family members in managing common family affairs without any written rules, and is solely based on each member's awareness of who is able to do what. This kind of support and cooperation become a means to support the work achievement of the female workers to contribute to family economic improvement, so as to improve the bargaining position of women in decision-making within the family.

References

Asyiek, Fauzia,SyahridanMolo, Marcelinus,Wanita , AktivitasEkonomi Dan Domestik: KasusPekerjaIndustriRumahTanggaPangan di Sumatra Selatan. Yogyakarta:PusatPenelitianKependudukan, UniversitasGadjah Mada.1994

Bungin,B.MetodologiPenelitianSosial,Format-format KuantitatifdanKualitatif.Surabaya:Airlangga University Press.2001

De Quelyoe, Ivone, Asnawi, Meinarni, Molo, Marcelinus.WanitadanIndustriRumahTanggaPangan di Irian Jaya, *Seri StudiWanita No.12*, PusatPenelitianKependudukan, Yogyakarta: UniversitasGadjah Mada,1994

FatemaKhatun, A.T.M FardausKabir,Woman SME Entrepreneur in ensuring woman empowerment in Bangladesh : A Study on Woman SME Entrepreneurs in Bangladesh, 2014, *AIJRHASS* (American International Journal of Research in Humanities, Arts and Social Science) 14-134, ISSN (Print): 2328-3734, ISSN (Online): 2328-3696, ISSN (CD-ROM): 2328-3688 , http://www.iasir.net

Hull, Valleri,Women in Java's Rural Middle Class: Progress or Regress, *Working Paper Series No.3*, Population Institute GadjahMada University, Yogyakarta.1976

Makararavy TY, ChhuntekSOV,John Walsh, PacapolAnurit, A Study of Woman Entrepreneur Development in Small and Medium Enterprises (SMEs) in Cambodia: Challenges and Opportu*nities*,*Journal Of Global Management Research*, Institute Fidal Inc. 2009

Sahara, Elvira. PemberdayaanPerempuandalamrangkamengentaskemiskinan di DesaSumberglagahKecamatanRembangKabupatenPasuruan.Program PascaSarjana. *Tesis.* Malang: Universitas Brawijaya,2000.

Schiller,BarbaraM.Women Work and Status in Rural Java.*Thesis.* Ohio: Ohio University.1978

Siswidiyanto, HeruSusilo, Sri MangestiRahayu, *PekerjaWanitaPadaIndustriRumahTanggaSandangdanKontribusinyaTerhadapPendapatanRumah Tangga,SuatuStudi di KecamatanTulungagung, KabupatenDati II Tulungagung,* JurnalPenelitianIlmu-IlmuSosial(Social Sciences) Vol.10 No.2 Agustus 1998.

Swasono,Sri Edi. PemberdayaanEkonomi Rakyat: StrategiPeluangdanKesadaranGender,*Materi Seminar danLatihantema: MindsetRevolution:PeluangBisnis UK Berbasis Gender danLingkungan,, 8 Juni 2009.*PPGK-Lembaga PenelitiandanPengabdianMasyarakat, Malang: Universitas Brawijaya,2009.

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Root Cause Analysis as an Alternative Solution for Patient Safety Incident in a Hospital in Yogyakarta

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Article Info

Keyword:

Patient safety,
Clinical incidence,
Hospital.

ABSTRACT

Patient safety system in hospital makes patient care safer. With the increase in patient safety, public confidence in the hospital services may improve. Patient safety can also reduce Adverse Events (AE). Adverse Events can occur due to excessive diagnostic and therapeutic, overwhelming health workers, complicated communication, and over use drugs and medication. The purpose of this study is to highlight a patient drug administration error using root cause analysis. The research method is based on the clinical incidence of a patient with drug administration error. Root causes analysis in PKU Muhammadiyah Hospital patient was performed in several stages. Safety Case Analysis showed staff factors, team factors, task factors, and communication factors during drug administration. In order to solve the problem, the hospital must ensure the use of SOP, develop effective communication, and create SOP for drug handover book. Also, there should be evaluation for the implementation schedule of daily nursing coordinator shift and improving the supervision of the implementation of 5 B with supervision.

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1. INTRODUCTION

In this globalization era, science and technology has developed rapidly, including in the field of medical technology. There is a lot of new medical equipment as well as drugs discoveries. These circumstances have an impact on health care, whereas the health service in the past was very simple, often less effective but safer. In the meantime, health care is very complex, but it is more effective if the health service provider can reduce potential occurrence of Adverse Events (AE) (C. Roberta, 2004).

By increasing the safety of the hospital, it is expected that the public confidence in the hospital services can be improved. In addition to reducing Adverse Events, patient safety also results in increased cost of services and can bring hospitals into an arena of conflict between the physician / health care workers and patients, leading to medical disputes, claims and legal proceedings, malpractice, etc., which can cause negative opinion in hospital services (KKP-RS, 2008).

Despite all efforts made related to patient safety systems, risks can still occur due to the complexity and intricacy of existing services at the hospital. In December 2012,an AE occurred on wrong medication because the patients' names were almost the same and the situation at that time was quite crowded so the incidence of administration error was inevitable. General fire safety as a concern related to the management of hospital patients did root cause analysis on the case in hopes of escape derived from the case (Andersen, 2006).

Yogyakarta Hospital is a hospital with high commitment to quality, as evidenced by the 16-field-accreditation, ISO 2008 and, now in the process of implementing JCI accreditation, as a commitment to quality care and patient satisfaction. Yogyakarta Hospital continues to fight to treat patients to get safety and comfort during treatment in Yogyakarta Hospital. General fire safety systems are used to be implemented to patients in the hospital. Patient safety is a hospital system where hospitals make patient care safer. The system is expected to prevent the occurrence of injury, which is caused by an error due to wrong action or no action execution which is supposed to be done (Departemen Kesehatan RI, 2006).

The purpose of this article is to present a case study that highlights a drug administration error patient and the application of a root cause analysis to remind the management that there are threatening

risks / circumstances, to monitor efforts to avoid the incident so it is no longer repeated, and to provide safety and comfort for hospitalized patients.

2. RESEARCH METHOD

This research used descriptive qualitative method on Root case analysis on drugs administration error to the inpatients in PKU Hospital Yogyakarta. Root Case Analysis is a structured evaluation method that identifies the root causes for undesired outcomes and the actions adequate to prevent recurrence. Process analysis method can be used retrospectively to identify the factors that cause adverse event.
The problem solving process on this case used root case analysis approach, including several steps as explained below:

1. Identifying the case that will be investigated
2. Determining the investigator team
3. Collecting data and information by observation, documentation, and interview
4. Mapping out the chronology of the events including Narrative chronology, Timeline,Tabular Time line, Time Person Grid
5. Identifying the CMP (Care Management Problem, brainstorming, brain writing)
6. Analyzing the information using WH questions technique, including analyzing each material, the obstacles, and fishbone analyzing.
7. Giving recommendation and work plan for improvisation

This research is set for drugs administration errors on the medical incidents. The sub type is about the mistake of the medical treatment process related to the problem in givingmedicine for the patients. The problem occurred is considered to be the patient's mistake and the drug administration error.

3. RESULTS AND ANALYSIS

Many root-cause analysis tools can be used by a single person. Nevertheless, the outcome generally is better when a group of people work together to find the cause of the problem. Those who are ultimately responsible for removing the identified root cause(s) should be prominent members of the analysis team that sets out to uncover them. A typical design of a root cause analysis in an organization might follow Andersen, B., & Fagerhaug, T (2006) steps (Departemen Kesehatan RI, 2006).A small team was formed to conduct the root cause analysis. Team members were selected from the business area of the organization that experiences the problem. The team might be supplemented by: a line manager with decision authority to implement solutions, an internal customer from the process with problems, a quality improvement expert in the case where the other team members have little experience with this kind of work. The analysis lasted about two months, relatively evenly distributed between defining and understanding the problem, brainstorming its possible causes, analyzing causes and effects, and devising a solution to the problem. During this period, the team met at least weekly, sometimes two or three times a week. The meetings were always kept short, at a maximum of two hours, and since they were meant to be creative in nature, the agenda was quite loose. One person in the team was assigned the role of making sure that the analysis progresses, or tasks were assigned to various members of the team. Once the solution had been designed and the decision to implement had been taken, it could take anywhere from a day to several months before the change was complete, depending on what was involved in the implementation process.

Troyer (2014), there are many methodologies, approaches, and techniques for conducting root cause analysis (Troyer, 2014). Events and causal factor analysis, widely used for major, single-event problems, such as a refinery explosion, is a process using evidence which is gathered quickly and methodically to establish a timeline for the activities leading up to the accident. Once the timeline has been established, the causal and contributing factors can be identified. Change analysis approach is applicable to situations where a system's performance has shifted significantly. It explores changes made in people, equipment, information, and more that may have contributed to the change in performance. Barrier analysis focuses on what controls are in place in the process to either prevent or detect a problem, and which might have failed. Management oversight and risk tree analysis, one aspect of this approach is the use of a tree diagram to look at what occurred and why it might have occurred. Kepner-Tregoe Problem Solving and Decision Making provides four distinct phases for resolving problems (DC: US Department of Energy, 1992).

3.1 General Principles of Root Cause Analysis

Root cause analysis' prime objective is to identify all the factors that contribute to the problems. One needs to investigate the underlying reasons that causes and aggravates the problems. A leader needs to look at every detail considering minor and major causes and should be able to identify which is the prime cause from the contributing cause and set lists of activities on how these causes can be solved permanently. An effective conduct of root cause analysis needs a systematic approach to the problem. Every concerned party needs to be involved in identifying the cause, proposing solutions, and documenting evidences that cause the problem. Usually, a team effort is required since details of the problem will come from employees and solutions may come from engineers, designers, and the top Management (Ledema, 2006).

Everyone in the organization that is concerned in solving and identifying a problem needs to know that there could be more than just one cause to a problem. In fact, it is of a prime difficulty to sustain an approach with an effort of developing a systematic identification of causes and underlying causes. In implementing the objective of preventing the cause from its recurrence, a problem solver needs to keep the solutions with a cost-effective approach. The less-cost approach will always prevail over other alternatives. However, cost effectiveness approach should be in consonance with a long term goal of keeping the problem from arising in the future. A less-cost solution may have a 10% probability of recurring, and then a slightly expensive solution will be more practical if it offers zero probability of coming back. An effective root cause analysis is entirely dependent on how root cause analysis is defined; problem statements should be clear and event descriptions need to be discussed in details. In analyzing the cause of the problem, a sequence of events and the timeline of occurrence should be established. This will be helpful in understanding the contributory factors to the problem, the root causes, and the probability of its recurrence in the future (Ledema, 2006).

3.2 General Process on How Root Cause Analysis Should be Conducted

To define the problem, the facts should be properly described and must include the qualitative and quantitative properties of the harmful effects. Collect the data and evidence because the problem solver needs document data and evidences, such as the normal condition prior to the problem, the output difference when the problem arises, the result of inaction and the timeline prior to addressing the problem and the inclusion of costs in solving the problem. Identify the factors that result in the harmful effects. Categorize causes into causal factors that contribute to the overall effects that interrupted the normal operation. Identify all corrective actions that will best help in keeping the recurrence of harmful effects. In addition, the leader needs to identify the results upon implementations of these corrective actions. Implement the best corrective actions. Constantly monitor the result of the corrective action (Boyer, 2001).

3.3 Root Cause Analysis for the Clinical Incident

Determine the degree of risk of an incident, impact (level of effects experienced by patients ranging from no injury to death), and probability (how often such incidents occur).

Asses Clinical Impact / Consequence / Severity
Effect assessment of the case,

- Value Impact :2(Minor)
- Value probability :4(Often / Likely) / several times / year
- Description : Moderate

From the results, the investigation should be done no more than 2 weeks. Managers / clinical leaders should assess the impacts on cost and manage the risks.

3.4 Stages of Completion

STEP 1 and 2
Incident identification and team selection for the case
Incident: one drug administration on patient who should not receive therapy but given captopril 25 mg as therapy
TEAM: Team Patient Safety
Chair: Working Group patient safety
Members: 1.Head of inpatient ward, nurse
2.Pharmacy Patient Safety Officer Committee
3.Head of medical services

STEP 3: COLLECT DATA AND INFORMATION

Direct observation: in the room when preparing pharmaceutical drugs and a ward. Documentation: Medical Record, Nursing notes, Book a drug handover, Prescription, SOP and barcode medication administration of drugs.

Interview: A Head Ward and Pharmaceutical Officer / Pharmacist.

STEP 4:CHRONOLOGY OF EVENTS (TABULAR TIMELINE FORM)

Events	Hospitalized patients	Time	December 1, 2012 (11.00)	December 3, 2012 (15.00)	December 3, 2012 (16.30)	December 3, 2012 (16.45)	December 3, 2012 (17.00)
Additional information	lung tuberculosis diagnosis	Prescription which was not adhered to the barcode label	The patients' names were similar		The medicine was delivered with pneumatic tube.	The morning shift nurse did not re-check the medicine in the book. There was no reconfirmation of the patients' medicine. There was a misperception at the pharmacy to patients who have similar names.	The patients felt sleepy and the blood pressure decreased about 10 mmhg. There was no report to the doctor.
Good practice	-	-	-	The pharmacist re-checked the prescription and the medicine.	-	The KTD events were reported.	The patients' status was observed
Service Problems	-	The barcode label was not examined according to standard operational procedures	The pharmacist did not identify the prescription.	The pharmacist did not re-check the identity on the prescription label to the medicineidentity package.	-	Medicine administration error Wrong handling of the patients	Miscommunication among the officers

STEP 5 CARE MANAGEMENT PROBLEMS (CMP)

Table 1.Identification of Care Management Problems

1.	Non-performance of SOP barcode label	5 why
2.	Officers did not identify pharmaceuticals receipt	5 why
3.	Pharmacist did not match the identity of the labeled prescription drug packaging	5 why
4.	Incorrect administration of the drugs	5 why
5.	Ineffective communication among officers	5 why

STEP 6 INFORMATION ANALYASIS FORM TECHNIQUE (5) WHY

Table 2. The Question List of Information Analysis

Why	Non-performance of SOP barcode label – Running out of barcode – Not asking for a barcode to the medical record – Busy telephone network when contacted
Why	Pharmacy Officers did not identify prescription – Barcode-less receipt – Prescription drugs that came simultaneously from the same ward with patients' similar names – Misperception that it was for one patient
Why	Pharmacist did not match the identity in the labeled prescription drug packaging identification. – Prescription drug in the pharmacy exceeded the average number of prescriptions with 185 prescriptions. Whereas, normally there were only 155 drug prescription within a day. – Pharmacist's perception in prescription drug identification, that it was for one patient
Why	Incorrect administration of drugs A ward unit – Morning shift nurses did not match the prescription to the medicine book. – Nurse's perception that the drugs given were correct for the patient Pharmaceutical Unit – Less accurate in identifying prescription drug – One of the officers' perception of the pharmaceutical drug
Why	Ineffective communication among officers – Not reported to the doctor – The patient's condition was good

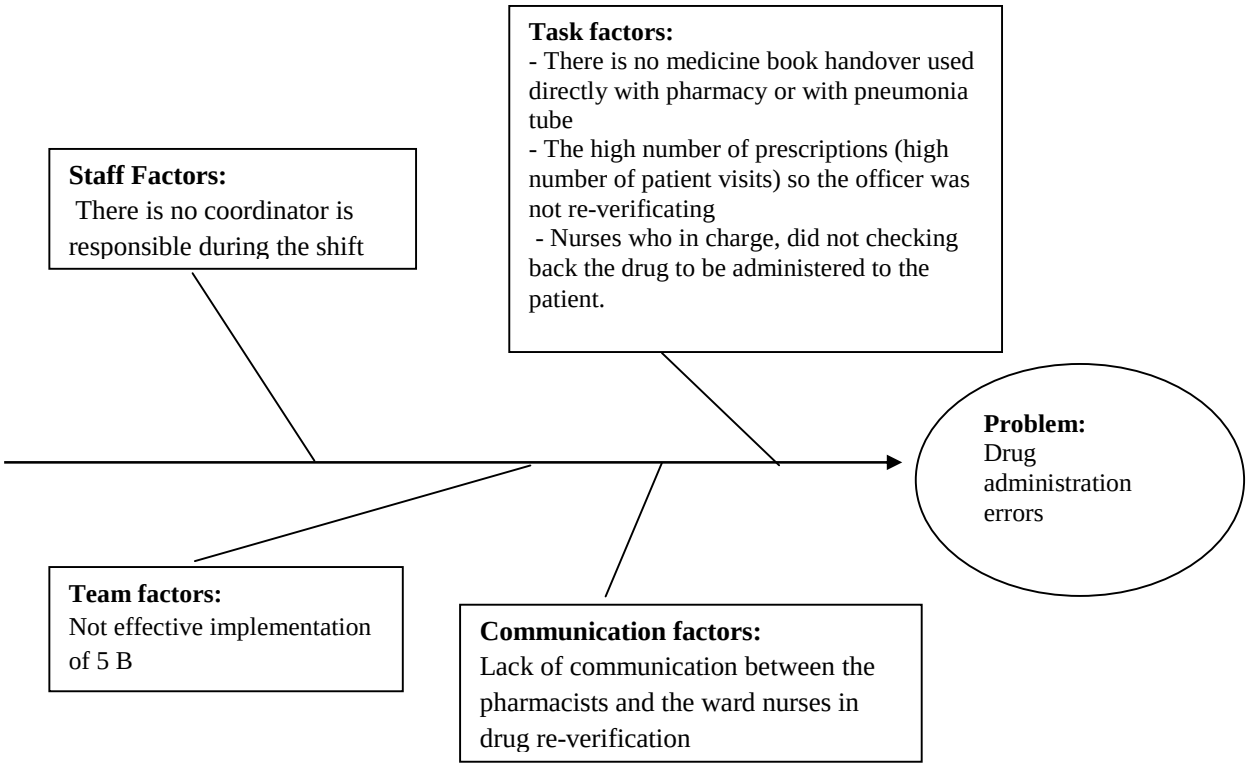

Figure 1. Fish bone drugs administrator factors

STEP 7 RECOMMENDATIONS AND ACTION PLAN FORM

Table 3. The Recommendation and Action Plan

ROOTS PROBLEM	ACTION	LEVEL RECOMMEN-DATIONS (Individual, Team, Directorate, RS)	PERSON ANSWER	TIME	RESOURCES REQUIRED
Drug administration errors	Improve the effectiveness SOP use	Team	Director of Services	Immediately	Recommendation
Lack of communication between the pharmacist and the ward nurses in drug re-verification	Improve the effectiveness of communication	Team	Director of Services	Immediately	Recommendation
No handover book directing whether to prescribe drug or pharmaceutical tube to patient with pneumonia	Making SOP of handover book and drugs	Team	Director of Services	Immediately	Recommendation
No shift coordinator in charge at the time of the shift	Evaluation of the implementation schedule of daily nursing coordinator shift	Team	Head of Nursing	Immediately	Recommendation
Ineffective implementation of the 5 B	Improve the effectiveness of the implementation of the 5 B with supervision	Team	Pharmacy Supervisor	Immediately	Recommendation

From Table 4, standard operating procedures are powerful tools for seizing control of work procedures. They define the subtle details that make the difference between success and failure in today's patient care. In addition, well-written SOPs act as effective communication tools that contribute to healthcare worker understanding and job satisfaction (Stup R, 2014). The SOP development process, while demanding, can provide significant performance improvements. When properly and fully carried out, the development process brings workers, managers, and advisers together in a collaborative way. As a result, everyone focuses their abilities on doing the best job possible with the resources (Stup R, 2014).

Canadian Centre for Occupational Health & Safety (2014) states that communication skills for health practitioners can mean the difference between life and death depending on how communication is handled, but there are also thousands of interactions in between that can result in poor quality treatment outcomes for patients (Canadian Centre for Occupational Health and Safety, 2014). In order to maintain a high degree of safety awareness throughout the workplace, all healthcare workers need to be kept informed on all safety problems and their solutions. Comprehensive minutes, personal contact with other, and reports at union and management meetings will all help to spread the information.

There are a number of key steps that must be considered when conducting implementation evaluations (Dusenbury, 2005). While the general framework of implementation evaluations has been reviewed in preceding sections, the following serve as more specific recommendations. First, uniform operationalized definitions of the components of program integrity (e.g., adherence, dosage, etc.) need to be employed when studying implementation (Dusenbury, 2003). In other words, a quality implementation evaluation needs to collect data from as many of the core integrity domains as possible. This process allows for comparison of implementation research findings errors during the process. Furthermore, all pertinent components of the program and implementation system need to be fully and clearly described in order to facilitate accurate and effective evaluation (Gresham, 1993).

4. CONCLUSION

Root-cause analysis is a tool designed to help identify, not only what, how, and why an event occurred but also is a tool to solve the problem. From the root cause analysis, hospitals have to make drugs handover books because it can anticipate errors in the handover between the pharmacist and care unit. SOP for drugs handover using pneumonia tube must be created. Periodic monitoring and evaluation needs to be performed in order to optimize the effectiveness of the implementation of 5B inrelated units.

REFERENCES

Andersen B, Fagerhaug. Root cause analysis: simplified tools and techniques. ASQ Qualit. 2006.

Boyer MM. Root cause analysis in perinatal care: health care professionals creating safer health care systems. J Perinat Neonatal Nurs [Internet]. 2001;15(1):40–54. Available from: http://www.ncbi.nlm.nih.gov/pubmed/12095006

Canadian Centre for Occupational Health & Safety. Joint Health and Safety Committee - Measuring Effectiveness: OSH Answers [Internet]. 2014. Available from: .ccohs.ca/oshanswers/hsprograms/hscommittees/measure.html

C. Roberta. Risk Management Handbook for Health Care Organizations. Jossey Bass; 2004.

DC: US Department of Energy. Root Cause Analysis Guidance Document. Washington,.DOE publication DOE-NE-STD-1004-92 [Internet]. 1992. Available from: http://www.hss.energy.gov/NuclearSafety/techstds/standard/nst1004/nst1004.pdf

Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. Health Educ Res. 2003;18(2):237–56.

Dusenbury L, Brannigan R, Hansen WB, Walsh J, Falco M. Quality of implementation: Developing measures crucial to understanding the diffusion of preventive interventions. Health Educ Res. 2005;20(3):308–13.

Departemen Kesehatan RI. Pedoman Sistem Rujukan Maternal dan Neonatal di Tingkat Kabupaten/Kota. Direktorat. Jakarta; 2006. p. p 1,6.

Gresham FM. Treatment integrity of school-based behavioral intervention studies: 1980-1990. School Psych Rev. 1993;22(2):254.

Iedema RAM, Jorm C, Braithwaite J, Travaglia J, Lum M. A root cause analysis of clinical error: Confronting the disjunction between formal rules and situated clinical activity. Soc Sci Med. 2006;63(5):1201–12.

KKP-RS. Buku Workdhop Keselamatan Pasien dan Manajemen Risisko Klinis di Rumah Sakit. 2008.

Stup R. Standard Operating Procedures: A Writing Guide Dairy Penn State Extension [Internet]. 2014. Available from: extension.psu.edu/animals/dairy/hr/tools-for-dairy-employee-supervisors/ud011

Troyer D. Getting to the Root of Poor Lubrication - Root Cause Analysis Techniques for the Lubrication Professional. 2014; Available from: www.machinerylubrication.com/Read/405/root-cause-analysis-lubrication

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The Role of Stretching on Musculoskeletal Pain Among Junior High School Students

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Article Info

Keyword:

Musculoskeletal Pain,
Stretching,
Junior High School Student

ABSTRACT

Students of Junior high school or senior high school often feel pain around their musculoskeletal muscle and bone. It is because of their incorrect way of carrying bags. An intervention to reduce musculoskeletal pain is practicing stretching and improving body postures by correcting the working position using chairs. To know and analyze the influence of static stretching toward musculoskeletal pain on junior high school students in Pontianak City. Quasi experiment was done with pre- and post-test without control group design with 240 students as its sample. The sample was chosen by simple random sampling technique with bivariate analysis by using t-test. Nordic Body map (NBM) was used as the instrument to measure the pain. After the stretching, the number of very painful upper neck decreased from 8 % to 3 %, painful upper neck from 33 % to 9 %, rather painful upper neck little from 18% to 10%. On the other hand, the number of unpainful upper neck increased from 41% to 78%. There was a significant influence between stretching and the reduction of musculoskeletal pain.

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1. INTRODUCTION

Pain usually occurs along with a disease process and mostly becomes the common reason for person to seek health care assistance for diagnostic and treatment processes. Students of elementary school, junior high school or high school often feel pain around their musculoskeletal muscles and bones because of the incorrect way they carry their backpack.

The results of a study conducted by physician Eric Wall, a children's orthopedic surgeon at Cincinnati Children's Hospital Medical Center, USA, showed that most of children generally complained of having headaches, neck pain, muscle stiffness, tingling hands, or lower back pain. Findings showed that non-standard backpack weight increases the prevalence of dropped shoulders, kyphosis and lordosis in elementary school students (Zakeri, 2016). Another research conducted in Italy on grade VI elementary students typically carrying loads of up to 10 kg in backpacks resulted in 46% complaining of pain in the back, while 66% of them admitted to fatigue (Zakeri, 2016).

Stretching is a process of stretching the muscles that will help increase muscle flexibility and mobility and maximize Range of Motion (ROM) from joints. Furthermore, stretching is a simple exercise done without repetitive motion on trained body parts (Kysner Caroline & Colby Lyn Allen, 2007). The movement starts from stretching the muscles in the joints as far as possible, then maintaining the position for 20 to 30 seconds (Subarjah, 2012). Besides, stretching is a practical action and can be done easily, set the spine to recovery, and can be done alone without media (Santi, 2013).

2. RESEARCH METHOD

This research is quasi experiment research with pre- and post-test without control group. There was a total of 240 students as the sample of the research. The sample was chosen by using simple random sampling technique. Instruments used for the pain assessment were Nordic Body map (NBM). The statistic data was analyzed by using t-test.

3. RESULTS AND ANALYSIS

a. Univariate analysis

Table 1:
Characteristic of Respondents based on Sex, Body Weight, and Backpack Weight

No	Characteristic	Categories	n=240	%
1	Sex	Male	118	49,16
		Female	122	50,83
2	Weight of backpack	< 15 %	80	33,33
		>15%	160	66,66

Source: Primary Data

Table 1 showed that the number of female (50.80%) was greater than male. The number of students who carried backpack that exceeded 15% more than their body weight was greater (66.66%) than those who carried backpack which was less than 15% of their body weight.

Table 2:
Characteristic of Pain

Variable	f	%
Neck Pain	205	85,41
Not Pain	35	14,58
Shoulder Pain	180	75
Not Pain	60	25
Arm Pain	132	55
Not Pain	108	45
Low Back Pain	110	45,83
Not Pain	130	54,16

Source: Primary Data

Table 2 showed that the number of students who experienced neck pain was the greatest (85.41%), followed by the number of the students who experienced shoulder pain (75%), and students who experienced low back pain (45.83%)

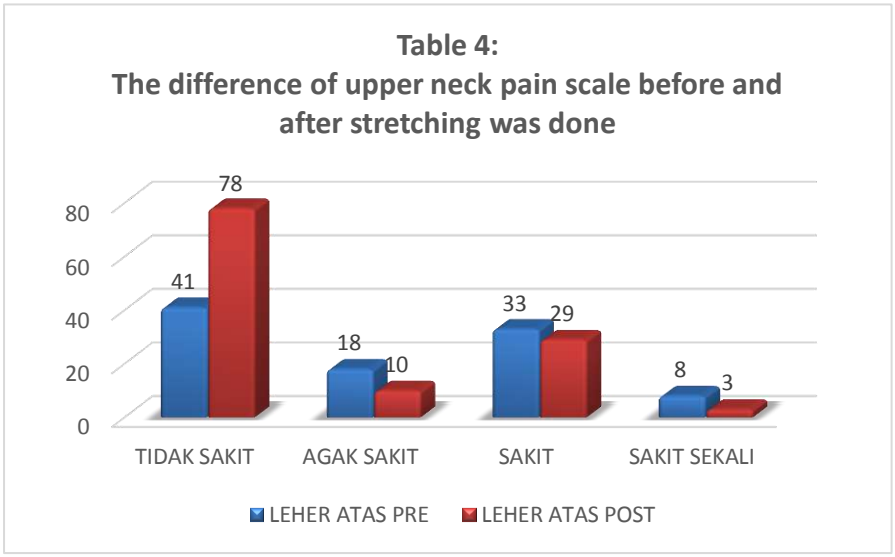
Table 3:
Respondents characteristic based on sex, body weight, and backpack weight

No	Characteristic		n=240	%
1	Gender	Male	118	49,16
		Female	122	50,83
2	Body weight and backpack weight	< 15 %	80	33,33
		>15%	160	66,66

Source: Primary Data

The table above illustrates that the number of female respondents (50.83%) were more than male respondents. On the other hand, the percentage of students' backpack weight that was more than 15% of the students' weight (66.66%) was higher than that of the backpack weighting less than 15% of the students' weight.

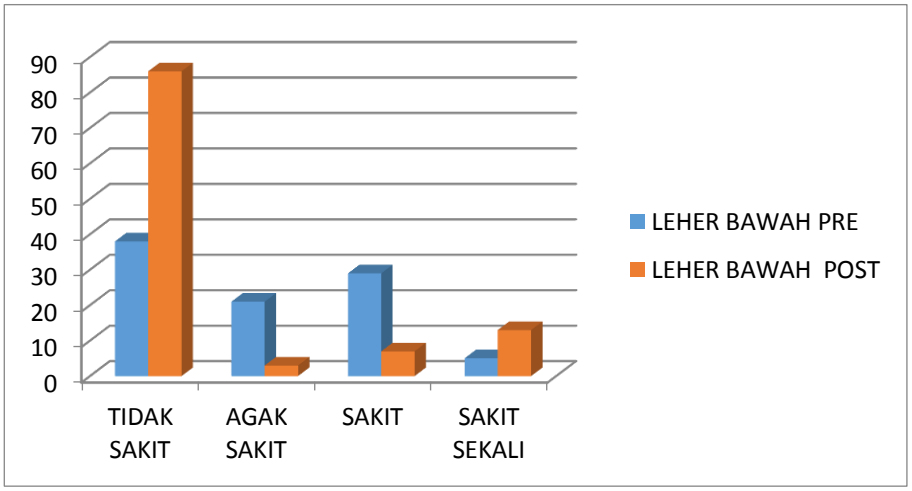
b. Bivariate Analysis



Source: Primary Data

The table above explained that before the upper neck stretching treatment was done, the percentage of painful upper neck scale was 33%. It decreased to 29% after stretching.

Table 4:
The different scale of lower neck pain before and after stretching was done on students (n=240).



Source: Primary Data

The table above explained that before the lower neck stretching treatment was done, the number of students who had painless lower neck was 90 people (38%). After stretching, the number increased to 206 people (86%). The number of students who had a rather painful lower neck was 50 people (21%) and decreased to 7 people (3%) after stretching. The number of students who had a painful lower neck was 70 people (29%) and decreased to 16 people (7%). Lastly, the number of students who had a very painful lower neck was 30 people (13%) and decreased to 11 people (5%) after stretching.

Based on the research findings, the scale of the pain in the lower neck muscle was categorized into painful (33%) and very painful (8%). After stretching, they changed into 9% and 3%. The results of a study conducted by physician Eric Wall, a children's orthopedic surgeon at Cincinnati Children's Hospital Medical Center, USA, showed that most children generally complained of having headaches, neck pain, muscle stiffness, tingling hands, or lower back pain. From the same institution, a doctor, Mark Goddard, explained that the complaints were caused by the use of backpacks with excessive loads in them (Zakeri, 2016). A study in Italy on grade VI elementary students who typically carried loads of up to 10 kg in their backpacks resulted in 46% complaints of pain in the back, while 66% of them admitted to fatigue (Zakeri, 2016). A study on 800 students in Turkey showed that the long use of bag for a 5-30 minute travel from home to school every day with an average bag weight of 5.267 kg or 12.3% of body weight caused shoulder pain (47.8%), pain in the lower back (21.6%) and pain in the neck (18.2%) (Khalil Al-Qato, 2012).

Meanwhile, based on the gender of students, the table above illustrates that the number of female students were more than male students with 50.83%. Meanwhile, the percentage of students' backpacks weight that was more than 15% of the students' weight was higher than that with weight less than 15% of the students' weight with 66.66%. It is suggested that males had more back pain than females in children aged 11-12. The statistically different results from previous studies were due to other factors affecting outcomes. There was a difference in the level of activity by gender on the respondents. The level of male activity was higher than that of female. Males also did more challenging and heavy sport types more often than females (Mahendrayani, 2015). According to the researchers at the time of observation, female students carried more objects that were not related to their school needs, such as small umbrella, food box, prayer tool, etc. Therefore, female students were more likely to have heavier bags with weight more than 15% of their body weight compared to male students (Adam, 2006).

4. CONCLUSION

This research showed that there was a significant relationship between weight of students' backpack and musculoskeletal pain, with P equal to 0.001, or less than 0.005. The weight of the bag of female students was heavier than that of male students. It was caused by the items carried by female students which were unrelated to school, such as prayer tool, lunch box, umbrella and others.

REFERENCES

Adam, McGrath, Pickett, and Van Den Kerkhof (2006).Pain prevalence in nine- to 13-year-old school children. *Pain research & Management : The Journal of the Canadian pain society*, 11(4), 234-40

Khalil Al-Qato, Alaa'Osaid.2012.The Influence of Backpack on Students books a cross-sectional Study of Schools in Tulkarm Distrist. Thesis. Faculty of Graduate Studies of An-NajahNational University. Palestine.2012,Volume 32,hal 339-350

Kysner Caroline & Colby Lyn Allen (2007), "*Therapeutic Exercise Foundation and Techniques*", FA. Davis, Philadelphia.

Mahendrayani (2015).HubunganBerattasdengannyeriPunggungBawahpadaAnakSekolahUsia 12-14 Tahun Denpasar. MajalahIlmiahFisioterapi Indonesia

Santi, P. A. (2013). The Effect of Giving Stretching Exercise To Decrease The Pain in Patients with Iskhialgia in LatuUsadha Nursing Care Clinic. COPING NERS (Community of Publishing in Nursing), 1(1).

Subarjah, harsono.(2012). Latihankondisifisik.diunduhdari http://file. upi. edudirektori / fpok / jur. _ pend. _ kesehatan _ % 26 _ rekreasi / prodi.ilmu _ keolahragaan / 196009181986031 herman _ s ubarjah / latihan _ kondisi _ fisik. pdf.

Zakeri, Y., Baraz, S., Gheibizadeh, M., &Saidkhani, V. (2016). Relationship between ackpack Weight and Prevalence of Lordosis, Kyphosis, Scoliosis and Dropped Shoulders in lementary Students. *International Journal of Pediatrics*, *4*(6), 1859-1866.

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The Effectiveness of Dhikr Intervention for Cortisol and IgG Mechanism; Case Study for Nurses in Sultan Agung Hospital of Semarang

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Article Info

Keyword:

Dhikr
Immunology
IgG

ABSTRACT

Stress factors have been caused immunological reactions that have been impacted on the disease. Previous study concluded that adaptation to environment surround through mechanism immune response, so conditions of cognitive stressors nurses performed with a refreshing mechanism through training for nurses. Study aims known correlation between dhikr intervention and increasing immunology for nursing. Study design were used time series intervention. Intervention was given for 3 week through three method intervention such teaching, guiding and environment. Research with level of significant 99% CI. Based on formula was calculated 35 samples. Data were analyzed with paired t test. Between three method intervention that environment method is domain highly score for intervention. Differences between pre and post intervention score for dhikr is significant *t = -2.808; p = 0.008.* Significant differences between before and after dhikr intervention for IgG. Dhikr intervention was significantly increasing of IgG levels for nurses in Sultan Agung Hospital.

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1. INTRODUCTION

Stressors for nurses can be derived from work environment such as workload, working conditions, shift work, and organizational atmosphere. Stress may modulate the immune response. Stress affects the perception of stress responses mirrored by changes in the immune response that determines the quality of individual immunity (Putra, 2011). Emotional and spiritual stressors mechanism can be explained through bio-behavioral processes associated with the body's hormone (Antoni, 2006). Stress factors can cause immunological reactions that have been impacted on the disease. Previous study concludes that adaptation to the surrounding environment can be done through immune response mechanism, so conditions of cognitive stressors that nurses received are treated with a refreshing mechanism through training for nurses (Del Guidice, 2010).

Stressor of down-regulation of β-adrenergic receptor scan lead to decreased immune response, especially on chronic psychological aspects (Dragos, 2010). Previous study concludes that the neurological aberrations associated with abnormal processes and deviation scan be derived from the system motor, communication and social conditions (Cascio, 2010).

Humans have exposure to religious, and are more likely to have the peace of self-regulatory mechanisms affecting anxiety. Anxiety coping mechanisms lead to tendency to have relatively stable hormone adrenaline (Mc Cain, 2005). Good emotional coping mechanism causes individual's good condition. Nursing problem service requires skilled nurses in spiritual and emotional aspects. Previous

research shows that changes in the stressors condition affects CNS, ANS, endocrine, immune and metabolic regulatory systems (Bell, 2012). Prevention of stressors conditions for nurses can be done through spiritual and emotional improvement. The results of previous studies on interventions shows that providing interventions of participative action research(PAR) have no significant effects on mental health, physical health and job satisfaction, but significantly against absent due to illness, service performance and control work p=<0.05 (Bond, 2001), giving emphasis on the intervention of relaxation such as meditation, mantras, singing (Van den Bossche, 2003).
Intervention against stressors for nurses can be done through behavioral approach, especially in the aspect of coping ability of nurses to the work environment (Klink, 2003). There are several studies on the effects of physical training to improve immunological responses that can adapt or cope with stressors (Kinser, 2011). Spiritual activities can provide tranquility that improves the immune response modulation (Zinnbauer, 2005). Stressors that have been going on for a long time may reduce the activity of axial HPA, stimulate fatigue and increase immune-mediated inflammatory activation. The difference serum of IgG Anti Chlamydia levels is very important in monitoring the immune response (Walls, 2008). Interventions are aimed to prevent psychological issues, so that the goal of the intervention is to improve the physical and psychological events through IgG level. IgG level is important for nurses' health stressor in giving services. Study aims to know the effectiveness of *dhikr* training for IgG level for nursing students at Sultan Agung Hospital.

2. RESEARCH METHODE

Study design

The study design used was time series intervention. Intervention was given with time series intervention with three-phase intervention, including *DhikrJaher, Dhikr Sirr* and *Dhikr Fi'ly* with three methods.
Design picture

O1 X1 X2 X3 O2

Note: **O1 = IgG Pre Intervention**
X1 = *Dhikr* Jaher
X2 = *Dhikr* Sir
X3 = *Dhikr* Fi'ly
O2 = IgG post Intervention

Figure 1. Study Design

Intervention method was used with teaching, guiding and environment. *Dhikr* intervention included 3 phase, including the first phase about Jaher *dhikr*, the second phase about Sir *dhikr*, and third phase about Fi'ly and ruh *dhikr*. The intervention was given for 3 weeks through three intervention method, including teaching, guiding and environment.

Interrupted Time Series Design

Sample size

The sample size estimation was based on intervention with *dhikr* sir, Jaher, fi'ly and ruh. The sample size was calculated based on the following formula: $n = \geq \frac{2S_p^2}{d^2}\left(t_{\alpha(2)} + t_{\beta(1)}\right)^2$, with σ2 = 72 (source: Ostmann & Biddle, 2012), d = 7 (source: Ostmann & Biddle, 2012), N = 35. The research had a test power of 95% and a significance level of 99% confidence interval. Based on the formula, the sample size needed for the research was 35 samples. The sample selection was conducted by systematic random sampling. The samples collected through sample frame arrangement. The first interval used simple random sampling and continued with the next step.

Intervention

Dhikr training with 3 intervention methods, which are teaching, guiding and environment, including *dhikr Sirr, dhikr Jaher* and *dhikr ruh* and *fi'ly*. The training was conducted with three-phase intervention. The training intervention program was implemented for 3 weeks. *DhikrJaher* was the first intervention phase, followed by *dhikr Sirr* second intervention phase, and *dhikrruh* and *fi'ly* 3 as the third intervention phase. *Dhikr* intervention was implemented with teaching method, guiding method and environment method. *DhikrJaher* included *bakhil/ dengki*(envy) aspect, *dhikr sirr* included *yaqdhah/ taubah* (reoentance)

aspect, and *dhikr fi'ly* included *tauhid/ syirik* (polytheism) aspect. The materials and packages of training modules for the intervention were developed first on the basis of the materials and modules from (Orem group, 2004, Syukur, 2012). The materials and packages of the training modules had been discussed with a public health expert.

Instrument and Data Analysis

IgG level from the pre- and post- test was acquired with Elisa test in Medical Faculty Laboratories of Diponegoro University. The effectiveness of *dhikr* was analyzed with questionnaire that included *dhikrjaher*, *dhikrsirr* and *dhikrruh*. (The questionnaire was adopted from Syukur, 2012). The data was presented in table, figure and narration. The data were analyzed with paired t-test with an interval confidence of 95%.

Validity Reliability

The instruments had been tested with validity and reliability tests. The validity test was performed with Pearson correlation test and the reliability test was performed with Alfa Cronbach with 95% confidence level. The instruments were distributed to nurses at NU hospital in Demak with a total sample of 34 nurses.

3. RESULTS

The study was conducted on 35 nurses who gave service in Sultan Agung Hospital. Based on the data, the characteristics of the research subjects, such as sex and age are described in Table 1.

4.

Table 1 Characteristics of Subjects based on sex and age.

No	Characteristic	N	%
1	**Sex**		
	Male	7	20
	Female	28	80
2	**Age**		
	20	7	20.0
	21	22	62.9
	23	6	17.1

Tabel 1 shows that the female is dominant. Additionally, the majority of the subjects are 21 years old with a total of 62.9%. Based on the data, the results of the intervention are described in Table 2.

Table 2 Results of intervention comparing the pre- and post-intervention of dhikr dzahir, sirr, and ruh/fi'ly*.*

No	*Dhikr*	Before intervention	After intervention	t	*p*
		Mean±SE	Mean±SE		
	Dhikr dzahir (Jaher)				
1.	*Teaching*	0.26±0.06	0.52±0.09	-28.254	0.000
2.	*Guiding*	0.27±0.10	0.55±0.13	-33.65	0.000
3.	*Environment*	0.31±0.10	0.60±0.13	-40.02	0.000
	Dhikr Sirr				
4.	*Teaching*	0.27±0.06	0.55±0.10	-20.03	0.000
5.	*Guiding*	0.27.±0.10	0.58±0.12	-24.59	0.000
6.	*Environment*	0.30±0.10	0.66±0.14	-24.80	0.000
	Dhikr Ruh				
7.	*Teaching*	0.28±0.06	0.64±0.14	-19.85	0.000
8.	*Guiding*	0.27±0.10	0.66±0.15	-20.76	0.000
9.	*Environment*	0.30±0.10	0.71±0.15	-22.28	0.000

Based on Table 2, we can see that there is a difference between pre- and post- *dhikr* intervention score. Based on three intervention methods, the environment method is the one domain with high intervention score. Based on the analysis, all substantial of *dhikr* is significant with p = < 0.01. The differences in IgG level in nurses in RSI Sultan Agung Semarang before and after intervention are shown in Table 3.

5.

Table 3. Differences in the state of IgG in nurses in RSI Sultan Agung Semarang before and after intervention

No	Subject situation	Pre-intervention	Post-intervention	*t*	*p*
		Mean±SD	Mean±SD		
	IgG	6696.95±1411.19	7762.04±1654.17	-2.808	0.008

Table 3showsthat there is a significant difference between the IgG scores before and after intervention with*t = -2.808; p = 0.008.* The difference between the IgG scores pre- and post-intervention is significant.

Discussion

Changes in stressor reaction are through various stages and it takes time to adapt to the source of stressors. Stressors need changes and adaptation systems of the body (stress perception) and (stress response) (Martin, 1993). Adaptation to stress in general has three phases of adaptation (Putra, 2011): alarm (warning), resistance and fatigue.

Dhikr Interventions decrease the perception of stress that can be seen in the manifestation of increasing IgG levels. The study suggests that IgG level is relatively better after getting intervention. The mechanism of *dhikr* intervention addressing for emotional and spiritual-related immunological mechanism could be explained through increase and decrease in the immune system (McCain, 2005). Stressors were first accommodated by the senses and forwarded to the emotional center which is located in the central nervous system (Walls, 2008). Stress will be channeled to organs through the autonomic nervous. Studies have proven that stress has led to changes in neurotransmitters, such as neurohormonal through various HPA axis (hypothalamic-Pituitary Adrenal Axis), HPT (hypothalamic-pituitary-thyroid axis) and HPO (hypothalamic-pituitary-Ovarial Axis) (Walls, 2008).

Based on IgG level, it was found that subjects had increased levels of IgG. The IgG level before intervention in a normal condition was between 500-1200 mg / dl for IgG (Walls, 2008). A previous study shows that immunological abnormal circumstances happen to a person who suffers from an illness. Perception Stress is reflected with changes in immune response that determines the quality of immunity (Putra, 2011; Walls, 2008; Martin, 1993). *Dhikr* intervention significantly affected neuro-immune system, such as IgG. The condition was used in the provision of material during training with methods of teaching, guiding and environment which included *dhikr* materials on *dhikr dzahir, sirr,* and *ruh/fi'ly* (Syukur, 2012)

Physical training can improve immunological response in order adapt to the source of stressor or coping with stressors. A chronic stress that induces fatigue and increase the activation of immune-mediated inflammation may be reduced through HPA axis activities. Measuring the IGg level with Anti Chlamydia serum is very important in monitoring the immune response (Walls, 2008). The study concludes that appropriate interventions to prevent stressor for workers with religious training are relaxing, especially for those who need more cognitive activity in order to work, since they do not require excessive physical activity. An increase in IgG average score is shown, which is from of6696.95±1411.19 to 7762.04±1654.17 .

Intervention against stressors for nurses can be done through behavioral approach, especially in the aspect of coping ability of nurses in the work environment. A previous study shows that physical training can improve immunological responses to help in adapting or coping with stressors (Kinser, 2012). Measuring IgG level with Anti Chlamydia serum is very important in monitoring the immune response (Zinnbauer, 2005). The interventions aim at preventing psychological issues, so that the goal of the intervention is to improve the physical and psychological events through IgG level. The stress condition indicates that the condition of excessive immunological secretion occurs due to the mechanism of body balance (Shelton, 2010). The study shows that emotional and spiritual state is relatively better after intervention. Thus, it can be concluded that immunology modulates one's condition through increased IgG level (Shelton, 2010).

4. CONCLUSION

Dhikr interventions include *Dhikr dzahir* (Jaher), *Dhikr* Sirr and *Dhikr* Fi'ly. They significantly increased the levels of IgG level of nurses in Sultan Agung Hospital. *Dhikr dzahir* (Jaher) was more effective, compared to Sirr and Fi'ly.

Acknowledgements

The authors would like to thank all participants for their willingness to share their experiences.

Competing interests
The authors declare that they have no competing interests

Reference

Antoni, M.H., Lutgendorf, S.K., Cole, S.W., Dhabhar, F.S., Sephton, S.E., McDonald, P.G., Stefanek, M., and Sood, A.K., The influence of bio-behavioural factors on tumour biology: pathways and mechanisms, *Nat Rev Cancer*. 2006 March ; 6(3): 240–248. Doi:10.1038/nrc1820.

Bell, I.R., and Koithan, M., A model for homeopathic remedy effects: low dose nanoparticles, allostatic cross-adaptation, and time-dependent sensitization in a complex adaptive system, *BMC Complementary and Alternative Medicine* 2012, 12:191

Bond, F.W and Bunce, D Job control mediates change in a work reorganization intervention for stress reduction, *Journal of Occupational Health Psychology (2001), vol. 6(4), 290 – 302*

Cascio, C.J. Somatosensory processing in neurodevelopmental disorders, *J Neurodevelop Disord* (2010) 2:62–69, DOI 10.1007/s11689-010-9046-3

Del Giudice, M., Ellis, B.J., Shirtcliff, E.A., Review: The Adaptive Calibration Model of stress responsivity. *Neurosci.Biobehav. Rev*. (2010), doi:10.1016/j.neubiorev.2010.11.007

Dragoş, D., & Tănăsescu, M.D., The effect of stress on the defense systems, *Journal of Medicine and Life Vol. 3, No.1, January-March 2010,* pp.10-18.

Kinser, P.A., Goehler, L., and Taylor, A.G., *"How Might Yoga Help Depression?"* A Neurobiological Perspective, Explore (NY). 2012 March 1; 8(2): 118–126. doi:10.1016/j.explore.2011.12.005.

Klink, J.J. van der, Blonk R.W., Schene AH, Dijk, F.J. van.. Reducing long term sickness absence by an activating intervention in adjustment disorders: a cluster randomised controlled design. *Occupational and Environmental Medicine,* (2003) *60,* 429-437.

Kloet, C. S. De, Vermetten, E., Rademakerm, A. R., Geuze, E., & Westerberg, G. M.). Neuroendocrine and immune responses to a cognitive stress challenge in veterans with and without PTSD. *European Journal of Psychotraumatology* 3, 6206, (2012doi: http://dx.doi.org/10.3402/ejpt.v3i0.16206

Martin (1993) "*Physical Pharmacy*" 4 th ed, Lea & Febiger, Philadelphia, 284-290, 295-304.

McnCain, N.L., Gray, D.P., Walter, J.M., and Robins, J., Implementing a Comprehensive Approach to the Study of Health Dynamics Using the Psychoneuroimmunology Paradigm, *ANS Adv Nurs Sci*. 2005 ; 28 (4): 320–332.

Orem Study Group (2004). *Working papers: The Orem Study Group of the 8 th World congress S-CDNT,* Sept. 29 – Oct, 3, 2004, Institute for nursing diagnostic and practice research. Clopenburg, Germany.

Putra, S.T *Psikoneuroimunologi Kedokteran*, Ed-2, Airlangga University Press. (2011)

Shelton, R.C., and Miller, A.H., Eating Ourselves to Death and Despaire: The Contribution of Adiposity And Inflammation to Depression, *Prog Neurobiol*. 2010 August ; 91(4): 275–299. doi:10.1016/j.pneurobio.2010.04.004.

Syukur Adan Usman F, "*Terapi Hati"*, Jakarta, Penerbit Erlangga, (2012)

Van den Bossche, S and Houtman, I *Work stress interventions and their effectiveness*: a literature review, TNO Work & Employment November 2003

Walls A. "*Resilience and psychoneuroimmunology: The role of adaptive coping in immune system responses to stress".* Dissertation Abstracts International 2008: Section B: The Sciences and Engineering 69;1350

Zinnbauer, BJ.; Pargament, KI. "*Measurement in the psychology of religion and spirituality*": Current status and evaluation. In: Paloutzian, RF.; Park, CL., editors. Handbook of the psychology of religion and spirituality. Guilford Press; New York: 2005. p. 43-61

High Dose of Vitamin A Supplement Decreases Bone Mineral Calcium Rate in 3-7 Weeks Old Sprague Dawley Rats

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Article histori

Keyword:

Vitamin A,
Retinol,
Supplement,
Osteoporosis,
Calcium

ABSTRACT

Vitamin A deficiency is still a main problem developing countries. Ironically, excessive vitamin A intake may contributes to the development of osteoporosis - a new threat with higher life expectancy in developing countries. Many studies have shown that high dose of vitamin A or more than twice the tolerable dose could prevent calcium deposit in the bone. This research aims to examine the effect of high dose of vitamin A intake on bone mineral calcium among Sprague Dawley rats. This is an experimental study with post test and simple random sampling. Eighteen female and eighteen male rats aged three weeks were divided into three groups: Group I as control group was left without treatment; Group II was given vitamin A 2x/weeks; and Group III was given vitamin A 7x/weeks for fourteen and twenty eight days. Hb, Hct, weight, and bone Ca rate were measured using Kolmogorov-Smirnov, while independent t-test and one-way ANOVA were used to identify the difference of female and male calcium contents and the comparison of calcium contents in all groups, respectively. One-way ANOVA analysis shows that there is significant difference of bone mineral calcium rate in all groups, whether 14 or 28 days of treatment ($p<0.05$). The second analysis using Bonferroni shows that 2x/weeks of vitamin A supplement has significant difference during the 14 days treatment, while for the 28 days treatment, the 7x/weeks group shows more significant difference than the other groups. At the meantime, the calcium deposit in the control group was decreasing. Conclusion: Bone mineral calcium rate in vitamin A supplement groups, whether the 2x/weeks or 7x/weeks, are significantly lower than the control group.

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1. INTRODUCTION

World Health Organization (WHO) mentions that osteoporosis is a status in which bone mass density is lower than 2.5SD or healthy adult female mean (T- score is <-2.5SD) [World Health Organization, 2007]. The Consensus of National Health Institute (NIH) also explains the terminology of osteoporosis as a disease showed by weaknesses of bone strength which may increase bone fragility and cause fracture risk(Marcus, 2010). In the scientific meeting of Indonesian association of osteoporosis in 2012, it was predicted that the number of osteoporosis patient would significantly increase because of higher life expectancy in 2020(PEROSI, 2012).Osteoporosis in children is called as rickets. That bone disease is problem related to nutrition (Stránský, 2009). One of nutrients is vitamin A. Many studies show that high dose of vitamin A or more than twice of dietary allowance can inhibit calcium formation in bone (Muthusami, 2005)(Lind, 2006)(Penniston, 2006)(Rothenberg, 2007)(Fahmy, 2009)(Johansson, 2004). Otherwise, Vitamin A deficiency is still being a health problem among 190million children and 19million women. Indonesia is one of the countries with vitamin A supplementation program to overcome problems on vitamin A deficiency. Many reports show the good impact of that program. However, the other problem can also be a threat for the future. National Institute of Health (2012) explained that toxic dose of vitamin A is 10.000IU (NIH Osteoporosis and Related Bone Disease National Resource Center, 2012).In addition, we know that the vitamin A in supplement is more than 10.000IU (Penniston, 2006). It may give some impact for the bone. This research has the objective to investigate the effect of high dose vitamin A supplement obtained from the government in bone mineral calcium rate.

2. RESEARCH METHOD

Study Samples

This experimental research with post-test only with control design used simple random sampling. This research was done in April-May 2016 at Food and Nutrition Research Center (PSPG) and Chemical Laboratory of University of Gadjah Mada and got permission from Medical and Health Research Ethics Committee (MHREC) with the letter number KE/FK/398/EC/2016. The sample for this study were 18 female and male Sprague Dawley rats aged 3weeks.

Treatment

The rats were divided into 3 groups. Group I was controlled group or the group without vitamin A supplement. Group II was the rats given 2x/week of vitamin A supplement. Group III was the rats given 7x/week of vitamin A supplement; during 14 and 28 days of treatment. The vitamin A supplement dose was 80mg/kg of weight gain (Fahmy, 2009). The diet was AIN-93G containing 5,000 mg calcium per kg diet. The vitamin A supplement was obtained from Public Health Office, D. I. Yogyakarta, Indonesia.

Measurements and Observations

The measurement of bone mineral calcium rate was done using dry method (ashing) and reading on Atomic Absorption Spectrophotometry. The intake and weight gain were also observed in this research.

Statistical Analysis

Kolmogorov-smirnov was used for Hb, Ht, weight, and bone mineral calcium rate. Independent t-test was analyzed to know the difference of bone mineral calcium rate between sex; and days of treatments. One-way ANOVA with Bonferroni was analyzed to know the difference of bone mineral calcium rate in all groups and to find out which one was the most significant.

3. RESULTS AND ANALYSIS

Sample Characteristics

18 female and 18 male Sprague Dawley rats aged 3 weeks (weaning period) were used. Their health status could be seen from Hb mean of 13.88 mmHg for female and 14.59 for male. **(Table 1)** All data in this research were normal.

Table 1. Sample Characteristics

Variable	n (%)	Mean±SD	*p-value**
Sex			
Female Male	18 (50%)	-	
	18 (50%)	-	
Hb (mmHg)	36 (100%)	14.24±0.48	0.747
Female	18 (50%)	13.88±0.34	
Male	18 (50%)	14.59±0.30	
Ht (mmHg)	36 (100%)	44.15±0.52	0.795
Female	18 (50%)	43.79±0.43	
Male	18 (50%)	44.51±0.29	
Weight gain of early treatment (g)	36 (100%)	33.69±4.85	0.673
Bone mineral calcium rate (%)	36 (100%)	13.05±1.79	0.123

Ket :
Hb =Hemoglobin
Ht =Hematocrit
If *p-value* >0.05; normal; (CI 95%)

The Effect of Vitamin A Supplement on Bone Mineral Calcium Rate, Weight, andIntake
Bone mineral calcium rate shows significant difference on 14 days of treatments in 2x/week groups. In 28 days of treatments, that group showed no significant difference, yet 7x/week showed it. Either 14 days or 28 days of treatments showed no significant difference of bone mineral calcium rate. **(Table 2)**

There was no significant difference of vitamin A supplement on bone mineral calcium rate between female and male, either 14 days or 28 days of treatment (*p*>0.05). There was indeed significant difference on male, yet the bone mineral calcium rate of male was higher than that of female. **(Table 3)**

Table 2. The effect of vitamin A supplement on bone mineral calcium rate based on days of treatment

Treatment (Days)	Groups(Mean±SD)			*p-value*[2]
	Control (1)	2x/weeks of vitamin A (2)	7x/weeks of vitamin A (3)	
14	15.29±2.95[a]	11.90±1.06[b]	12.46±0.58[ab]	0.0132*
28	13.83±0.87[a]	12.66±0.87[ab]	12.14±0.95[b]	0.0152*
p-value	0.5792			

[a,b]) different notations on the same line showed *p-value*< 0.05

*) *p-value* < 0.05

Table 3. Vitamin A supplement on bone mineral calcium rate based on sex

Sex	Groups(Mean±SD)			*p-value*[2]
	Control (1)	2x/weeks of vitamin A (2)	7x/weeks of vitamin A (3)	
14 days o.t				
Female	16.44±4.13	12.50±0.93	12.70±0.31	0.1668
Male	14.14±0.83[a]	11.30±0.92[b]	12.22±0.76[ab]	0.0156*
p-value	0.3996	0.1839	0.3700	
28 days o.t				
Female	13.33±0.41	13.03±1.18	11.72±1.16	0.1841
Male	14.34±0.98[a]	12.29±0.28[b]	12.57±0.61[ab]	0.0206*
p-value	0.1748	0.3514	0.3219	

[a,b]) different notations on the same line showed *p-value*< 0.05
*) *p-value* < 0.05

Theoretically, high dose of vitamin A supplement results in lower appetite, yet it was not found in this research. Rats intake was increasing yet the weight gain was decreasing **(Figure 1 and 2)**
Bone mineral calcium rate is one of important indicators of osteoporosis. In general, one way ANOVA analysis shows that there is significant difference of bone mineral calcium rate in all groups. It means that high dose of vitamin A supplement as intervention has impact in lowering bone mineral calcium rate. On 14 days of treatment, the bone mineral calcium rate is the lowest in 2x/week group, yet the 7x/week group is the lowest on 28 days of treatment. Theoretically, it shows that osteoporosis has already occurred in either 14 days or 28 days of treatment. Osteoporosis happens when calcium storage in bone decreases. The low rate of bone mineral calcium in both vitamin A supplement groups show that calcium is in the limit status, so osteoporosis occurs.

Calcium in blood is always in normal level and there is homeostatic for maintaining it, or else it will be taken from both bone and teeth storage. The mechanism is when blood calcium is in a low status, parathyroid hormone (PTH) will be released. It can cause osteoclast resorption, so blood calcium will be normal. If this mechanism occurs continuously and there is no more osteoblast formation, and calcium is decreasing continuously, osteoporosis will occur (Marcus, 2010)(Alexander, 2011)(, Reid, 2011).
In this research, high dose of vitamin A, in either 2x/week or 7x/week, boost up osteoporosis status through various mechanism. The main mechanism is excess retinol impairs rapidly the endosteal/marrow blood flow which leads to hypoxia and pathological endosteal mineralization [Lind, 2011]. It happens in both female and male rats. In addition, the important thing is excess retinol can be changed into retinoicacid.

In vitro studies showed in summary, it can be seen that vitamin A (retinol) inhibits collagen synthesis, that retinoic acid directly stimulates osteoclastic bone resorption. On the other hand, other studies showed that retinol and reinoic acid have an inhibitory effect on osteoblastic cell proliferation in vitro. In short, osteoblasts and osteoclasts express nuclear receptors for retinoic acid, that high doses of vitamin A increase osteoclast numbers and reduce osteoid surfaces in rats. High doses of vitamin A inhibit bone collagen synthesis, and despite stimulation of collagenase synthesis in osteoblasts, formation of osteoclasts and osteoclastic bone resorption is enhanced(Burckhardt, 2015).

On the other side, retinoic acid also inhibits nuclear factor of activated T-cells c1 (NFATc1) expression and osteoclast differentiation. It increases proliferation of human osteoclast progenitors and inhibits RANK-stimulated osteoclast differentiation by suppressing RANK. In summary, vitamin A (both retinol and retinoic acid) reduced activity in cortical bone and increased activity in the endosteal/marrow compartment. Then, cellular retinol-binding protein 1 (CRBP-1) also has a role, since it regulates osteogenesis and adipogenesis of mesenchymal stem cells (Xu, 2012).

A new light was shed on bone effect of vitamin A with investigations on the interactions with vitamin D. Embryonic skeletal hypoplasia was partially explained by the suppression of retinoic acid-receptors resulting from vitamin A deficiency in maternal rats with chronic vitamin D deficiency. Later investigations pointed to an interference with the utilization of vitamin D and its hydroxylase metabolites. Vitamin A antagonized the ability of vitamin D to maintain normal plasma calcium level in the rats, resulting in higher vitamin D requirements. On the other side, it has a protective effect against hypervitaminosis D, specifically against the bone resorption induced by 1.25 $(OH)_2$ vitamin D_3 in vitro. There are nuclear receptors of vitamin A in the bone of rats, and vitamin A influences gene expression in conjunction with vitamin D. The receptors of both vitamins bind to the target genes as heterodimers, with $1.25(OH)_2D_3$ activating the vitamin D receptor-Retinoid X receptor complex. Hypervitaminosis A increases the formation of retinol X-retinoic acid receptor complexes, thereby reducing the availability of retinol X receptor and decreasing the efficacy of vitamin D. It also causes rickets in normally replete animals (Burckhardt, 2015).

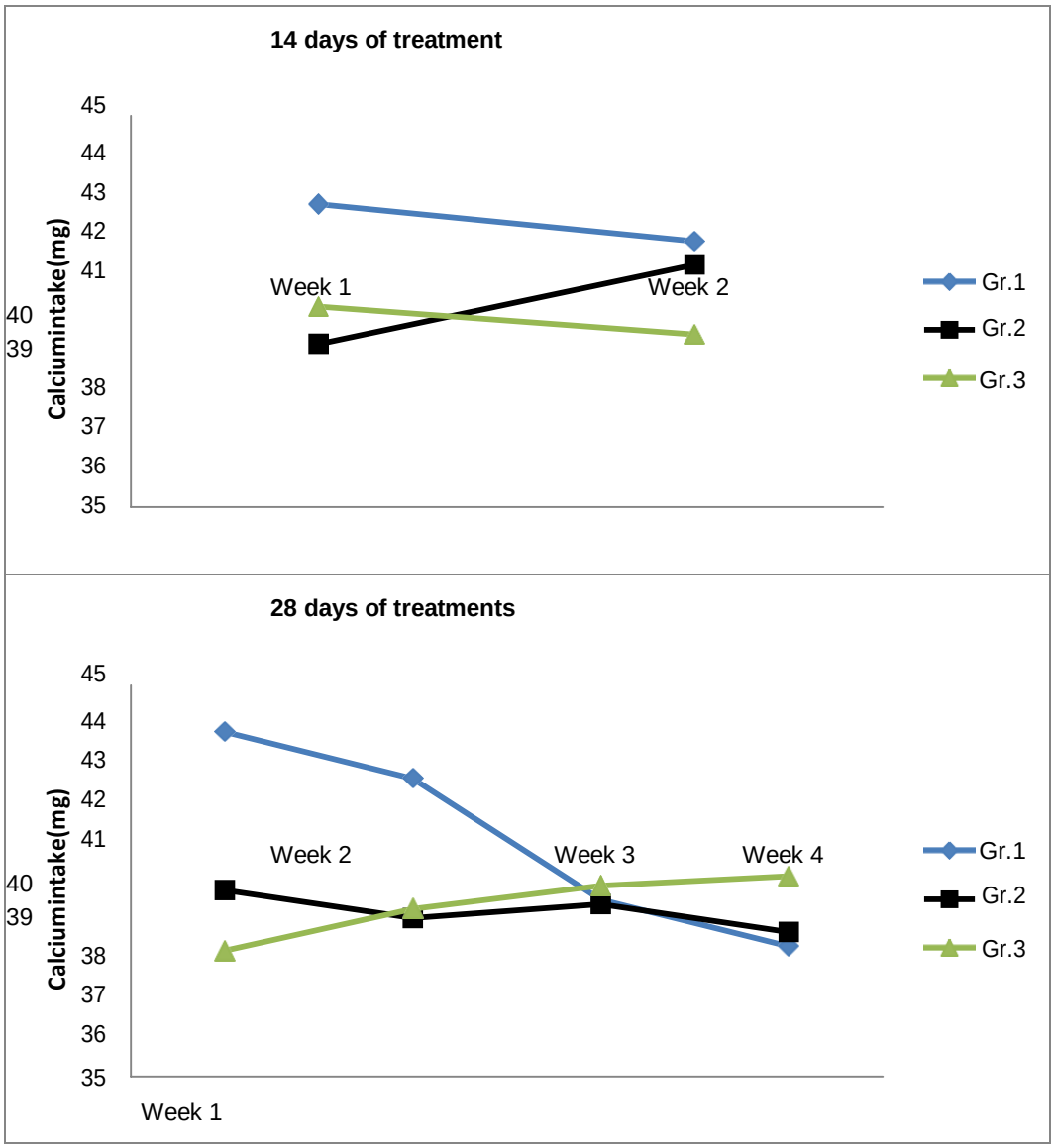

Figure 1. Calcium intake during 14 days and 28 days of treatment

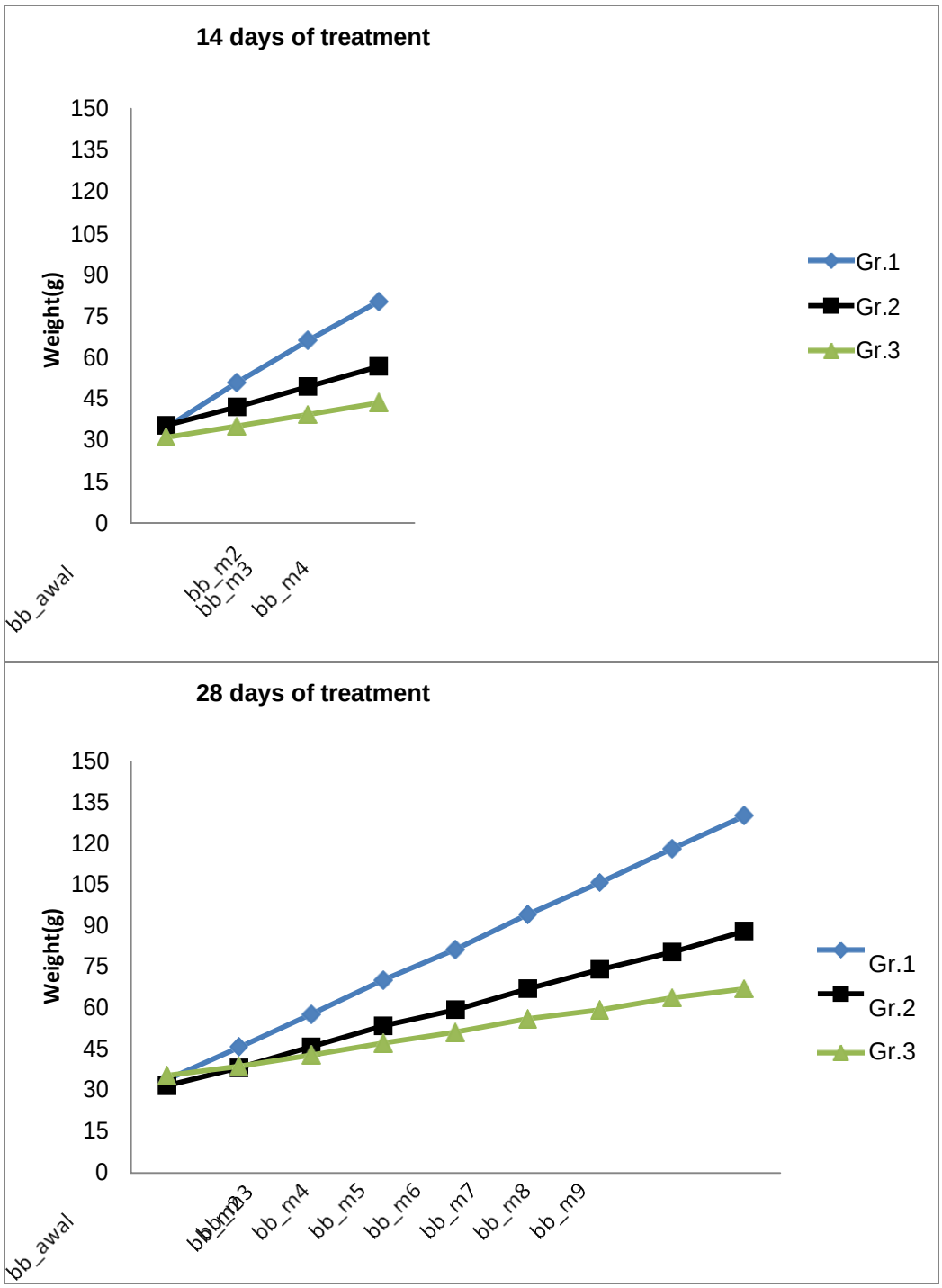

Figure 2. Weight during 14 days and 28 days of treatment

This research also investigates the significant difference of bone mineral calcium rate in male. On the other hand, the bone mineral calcium rate in male was higher than that of female. Based on the intake data, 2x/week of vitamin A supplement group only increased in second week. Meta-analysis research from randomized controlled trials in children showed that there was no effect of evidence of calcium supplement given to both girls and boys on bone mass density (BMD)(Winzenberg, 2006). Women are at risk of osteoporosis when they reach menopause status in which estrogen hormone is no longer produced in aged women (Houtkooper, 2004).

High doses of vitamin A supplement have impact on lower appetite yet it was not found in this research. The rats intake was increasing yet weight gain was decreasing. This is in line with Smith and Mangkowidjojo's statement that rats have negative control of intake, whereas if the weight gain is heavier, rats will decrease their intake (Smith, 1998). Based on direct observation, the controlled group has lower activity than both treatment groups. The low activity might be the consequences of heavier weight gain. It is also in line with Florentino(1990) who said that there are positive reactions, i.e. improved appetite, more sound sleep, and changes in behavior (children become more active and lively)(Florentino, 1990). The decreasing of weight in both treatment groups might also be influenced by the decreasing of bone mass calcium rate. In surgery process, the femur bone of both treatment groups is smaller than that of controlled group.

4. CONCLUSION

The Vitamin A supplement groups, either 2x/week or 7x/week, have lower bone calcium rate than that of controlled group. In 14 days of treatment, 2x/week of vitamin A supplement shows the effect in lowering bone calcium rate. The intake of both treatment groups is higher than that of controlled group. However, their weight gain is lower than in controlled group.
Knowing that there is a negative impact of 200,000IU of vitamin A supplementation sub-clinically, it is suggested to measure or assess bone mineral density in children. It is also important to enhance information to increase daily calcium intake.

REFERENCES

Alexander, IM., and Knight, KA. 100 Questions & answers about osteoporosis and osteopenia. 2nd ed. USA: Jones and Bartlett Publishers. 2011.

Burckhardt, P. Vitamin A and bone health. In: Nutrition and Bone Health, 2nd Ed. New York: Humana Press in a hand of Springer;2015.

Fahmy SR, and Soliman AM. Oxidative stress as a risk factor of osteoporotic model induced by vitamin A in rats. *Aust. J. Basic Appl.,*3(3): 1559-1568;2009.

Florentino, R.F., Tanchoco, C.C., Ramos, A.C., Mendoza, T.S., Natividad, E.P., Tangco, J.B.M., and Sommer, A. Tolerance of preschoolers to two dosage strengths of vitamin A preparation. *Am J Clin Nutr* ;52:694-700; 1990

Houtkooper, L., and Farrell, V.A. Calcium Supplement Guidelines. Arizona: The University of Arizona;2004.

Johansson S. Vitamin A and osteoporosis: experimental and clinical studies. *Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine* 1392. Uppsala. ISBN 91-554-6100-X;2004.

Lind PM, Johansson S, Ronn M, and Melhus H. Subclinical hypervitaminosis A in rat: measurements of bone mineral density (BMD) do not reveal adverse skeletal changes. *Chem. Biol. Interact.,* 159(1): 73- 80; 2006.

Lind, T., Lind, P.M., Jacobson, A., Hu, L., Sundqvist, A., Risteli, J., Yebra-Rodriguez, A., et al. High dietary intake of retinol leads to bone marrow hypoxia and diaphyseal endosteal mineralization in rats. *Bone.* 2011;48(3):496-506;2011.

Marcus R, Feldman D, Nelson DA, and Rosen CJ. Fundamental of osteoporosis. United

Kingdom: Elsevier;2010.

Muthusami SI, Ramachandran B, Muthusami G, Vasudevan V, Prabhu V, Subramniam A, Jagadeesan, and Narasimhan. Ovariectomy induces oxidative stress and impairs bone antioxidant system in adult rats. *Clin Chim Acta,* 360: 81-86; 2005.

NIH Osteoporosis and Related Bone Disease National Resource Center. Vitamin A and bone health. USA: Circle Bethesda;2012.

Penniston KL, and Tanumihardjo SA. The acute and chronic toxic effects of vitamin A. *Am J Clin Nutr;*83:191-201;2006.

PEROSI. Kursus osteoporis dan densitometri tulang PEROSI-IRA- PERKENI. http://www.perkeni.org/?page=jurnal.detail&id=63. Accessed on March 27, 2013;2012.

Rothenberg AB, Berdon WE, Woodard JC, and Cowles RA. Hypervitaminosis A-induced premature closure of epiphyses (physeal obliteration) in humans and calves (hyena disease): a historical review of the human and veterinary literature. *Pediatr. Radiol.,* 37(12):1264-1267; 2007.

Smith, J.B., dan Mangkoewidjojo. Pemeliharaan, pembiakan, dan penggunaan hewan percobaan di daerah tropis. Jakarta: UI Press;1998.

Stránský M and Ryšavá L. Nutrition as prevention and treatment of osteoporosis. *Physiol. Res.* 58 (Suppl. 1): S7-S11;2009.

Reid, and David M. Handbook of osteoporosis. London: Springer Healthcare;2011.

Winzenberg, TM., Oldenburg, B., Frendin, S., De Wit, L., and Jones G. A mother-based intervention trial for osteoporosis prevention in children. *Prev Med.*;42: 21;2006.

World Health Organization. *WHO scientific group on the assessment of osteoporosis at primary he*

Xu, L., Song, C., Ni, M., Meng, F., Xie, H., and Li, G. Cellular retinol- binding protein 1 (CRBP-1) regulates osteognesis and adipogenesisof mesenchymal stem cells through inhibiting RXR-induced catenin degradation. *Int J Biochem Cell Biol*; 44(4):612-9;2012.

The Influence of Marketing Mix (Place, People, Promotion and Process) on Customers' Decision Making Process in Choosing Vania Hospital, Bogor 2016

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Article Info

Keyword:

Place,
People,
Promotion,
Process,
Decision Making

ABSTRACT

Initial observation and internal evaluations conducted byVaniaHospital in 2015 show the results achieved do not match the achievement target. One strategy that can be done to achieve the target, namely by winning market service competition through marketing mix strategy.Therefore, researchers interested in conducting research entitled The Effect of Marketing Mix Aspects Place, Human Resources, Promotion, and Process on Decision Choosing Vania Hospital in 2016.This research is raining to know how far the influence of marketing mix of place aspect, human resources, process, and promotion to consumer decision choose RS Vania year 2016. This research is quantitative research with Quantitative Analysis Method which in process with Path (Path Analysis). The sample was taken using Stratified Random Sampling method from outpatient and inpatient in Vania Hospital totaling 100 samples. Primary data and secondary data were obtained from interviews, observation, literature study, and questionnaire.The conclusion of this research is Marketing Mix of Place Aspect, Human Resource, Promotion, and Process have a significant and positive relationship to Decision of Selecting Hospital, either direct or indirect relationship.Suggestion from this research is decision of consumer choose service at RS Vania will increase by improving quality of marketing mix of place aspect, human resource, promotion and process so that expected target of RS can be reached.

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1. INTRODUCTION

The Constitution of the Republic of Indonesia no. 44/2009(UURINomor44, 2009) states that health service is the rights of everyone. Hospital is one of the facilities to give this service for inpatients, outpatients, and emergency patients. Good health service is a health service that covers promotive, preventive, treatment, and rehabilitation. As a health service unit, hospital has its own specific characters influenced by the development of knowledge, technology, and social economic life of the society and it has to keep improving its affordable quality of service, so that health level of the society can be acheived optimally.

Based on the industrial side, hospital refers to a health service provider which has socio-economic and business values. A new paradigm in managing the hospital is supported by the change ofmind-set of service users or patients, health service providers or medical staff, paramedics, and other medical staff, society, scientists and or professionals in developing knowledge and medical technology.

There are several changes of stake-holders' mindset, covering the followings:

1. Health users or patients and society; Hospital should encourage medical and special health service, quality of curing and recovering, fast response towards any complaints, and comfortable health service.
2. Hospital owners; Focusing on the efforts of the hospitals to keep and improve its brand so that the visions of the hospital can be achieved effectively and efficiently and so that operationally it can make profits.
3. Medical staff/providers; Focusing on the efforts to improve the quality of service covering any service with sophisicated and modern health tools and medical facilties and information so that the process of the health service can become more efficient and competitive.
4. Scientists and medical technology; Focusing on the development of medical technology facilities, expertise and professionalism.

The existance of several hospitals will promote competition. Thus, in a competitive situation, marketing the hospital becomes one of the options to be used in order to fulfill its optimum functions. According to Sabarguna(2008)' marketing which was formerly considered taboo in the education world has been being actively digged and used in order to create an efficient operational service.

Bogor City is occupied by 1.030.720 people[Statitic Board of Bogor City, 2015]and is supported by 17 hospitals with the capacity of 2.548 beds (Health Department of Bogor City, 2015). According to World Bank [TheWorld Bank.2014], the standard number of available beds at hospitals is 1 per 1000 people in the society. It shows that Bogor City has exceeded the minimum standard. Consequently, it creates a fiercer competition among hospitals in Bogor City.

Marketing-mix becomes one of the strategies generally chosen by service provider to win the competition. As Lovelock (2007) argues, there are 8 variables in marketing-mix, i.e. product elements, place, cyberspace and time, promotion and education, price and other user outlays, process, productivity and quality, people and physical evidence (8P). These 8 variables are used synergically. The broader macro will also become influence factors such as economic, technology, politics and culture (Kottler, 1997). Psychology and character of customers would also intrinsic factor to influence customer in decision making process (Tjiptono, 2005). According to (Sangaji, 2013), Product, Brand, Dealer, Purchase Timing, Purchase Amount are some influencing factors of customer decision.

Table 1. BOR of Inpatients at Hospitals in Bogor, 2015

NO	NAMA RUMAH SAKIT*	JUMLAH TEMPAT TIDUR	PASIEN KELUAR (HIDUP + MATI)	JUMLAH HARI PERAWATAN	JUMLAH LAMA DIRAWAT	BOR (%)
1	RS. Vania	90	1464	5.580	5.985	17,0
2	RS Melania	68	3.201	15.503	15.514	62,5
3	RSIA Ummi	123	2.823	9.635	9.873	23,7
4	RSIA Juliana	41	1.949	5.215	5.253	34,8
5	RS. Medika Dramaga	110	10.001	31.869	32.005	77,8
6	RSIA Bunda Suryatni	35	625	2.225	2.520	17,4
7	RS Islam	89	4843	19.360	19.499	59,6
8	RSU Azra	88	5.068	19.123	19.134	59,5
9	RS PMI	266	19235	63.794	75.382	65,7
10	RS BMC	95	7.828	24.634	32.554	69,7
11	RSUD Kota Bogor	207	17785	54.236	57.485	73,6
12	RSMM	640	7.490	94.968	99.952	44,4
13	RS Mulia	89	2.884	9.934	10.140	30,6
14	RSB Pasutri	29	2700	7.314	7.616	69,1
15	RS. Hermina	115	8042	24.021	24.322	57,2
16	RSKIA Sawojajar	25	305	1.864	1.967	20,4
17	RS Salak	152	11.167	34.761	35.791	62,7
KOTA BOGOR		**2.262**	**107.410**	**424.036**	**454.992**	**49,7**

Source: Health Department, Bogor City 2015[4]

BloomPNexplains that in order to make a product succesful in the market, several stretegies should be adopted, such as using an effective marketing, having unique products, having competitive technique, and offering competitive price (Bloom,2006).

Vania Hospital is one of the 17 hospitals in Bogor City, and is established in 2014. It is located on Jalan Raya Siliwangi 11, Sukasari, Bogor Timur sub-district. It is 6900m² with 4 floor-building, facilitated with Intensive Care Unit (ICU), Neonatal Intensive Care Unit (NICU), and

Perinatal Intensive Care Unit (PICU). This hospital is categorized into type C Public Hospital which provides 24-hour service for outpatients, inpatients, as well as other services (Profisl RS Vania, 2014).

Vania Hospital as a type C hospital offers several specific standard services and specific excellent services such as heart specialists, mouth and teeth surgery, pathology clinic, orthopedics, lung specialist, urology specialist, medical rehabilitation specialist, special medical rehabilitation, neuro-surgery, beauty clinic, and hemodialysis service. However, several services still have limited service time. This hospital has 97 beds.

It can be seen from Table 1 that Bed Occupation Rate (BOR) of Vania Hospital in 2015 was 17%. It had the lowest percentage out of the 17 hospitals in Bogor City. This is below the standard of Ministy of Health in 2005 which is 60%-85%. The total number of visits for outpatients at Vania Hospital in 2015 was10,171 and the inpatient was 1,475. The numbers indicated that the hospital had the lowest visit rate among all public hospitals in Bogor City. Therefore, Vania hospital faced a fundamental low performance. Referring to pre-observation and prior discussion with the leaders of this hospital, several other internal and external issues are found,including inhuman resources,health service process, irregular service hours in several polyclinics, inavailability of special marketing person, limited facilities of ICU room, terrible traffic and a-one way street system to access this hospital, close distance with other hospitals as competitors.

Based on those problems, the researchers decided to have research on marketing mix of the following aspects; hospital's location, human resources, and theoretical framework of promotion which then become the basis of this research toward customer decision making process.

2. RESEARCH METHOD

This research applied quantitative method with Path Analysis. The study was conducted from February 2016 – June 2016 at Vania Hospital. The sample size was decided by using Slovin formula in Riduwan (Riduan dan Kuncoro,2013). A proportional stratified random sampling was used in choosing 100 sample as respondents out of total population of 2507 in which 2172 respondents were inpatients and other 335 respondents were outpatients (α = 10%**)**. The proportion of this sampling technique was based on total numbers of in- and outpatients and the total number of policlinics. The data were collected by using questionnaire with Measured-scale and Likert-scale.

Exogenous variables (X) measured were location (X1) and human resources (X2), while the intervening variables covered promotion (Y1) and process (Y2). On the other hand, the endogenous variables were the process of patient in taking decision (Z). The data were analyzed quantitatively through path analysis which was processed by analytical tool SPSS.

Before conducting the research, both validity and reliability tests were conducted towards the instruments. These tests were aimed atproving that the instruments used in collecting the data were valid. Besides distributing questionnaires, the researchers also did an observation on the environment of the hospital in order to see perception level of the competition among hospitals near Vania Hospital and to observe the updated data available at health department of Bogor City.

3. RESULTS AND ANALYSIS

3.1. Profile of Vania Hospital

Vania Hospital was founded by PT. Karunia Asih Cemerlang in 2014. Vania Public Hospital Bogor is a type C hospital built in an area of 3.185 m², in which 6.900 m2 of the building is allocated for the operational of the services. It is a single-vertical building consisting of 4 floors, located on Jalan Siliwangi No. 11, Sukasari, East Bogor.

This hospital provides 17 health services, i.e. internists, pediatrician, obstetricians and midwifery, neurologist, general surgery, mouth surgery, ophthalmologist, ears, nose and throat specialist, specialist for lung disease, heart disease, and genital skin disease, radiology, clinical pathology, and medical rehabilitation. Besides, this hospital also offers non-specialist health services covering emergency care unit, general practitioners, dentist, beauty and skin care and psychologist.

The main facilities available in this hospital are beds, 7 emergency care units, 7 Intensive Care Unit (ICU) rooms, 2 rooms for Neonatal Intensive Care (NICU), and 1 room for Isolated ICU. The rooms for inpatients are classified into several classes; 12 rooms of Class I, 12 rooms of Class II, 18 rooms of Class III, 6 pediatrict rooms, 1 isolated room, 4 VVIP rooms, 19 VIP rooms, 2 Perinatalogy rooms, and 7 hemadialysis rooms.

3.2. Characteristics of Respondents

The patients as respondents have the following characteristics:

1. Age
   a. 17 – 25 years old 10%
   b. 26 – 45 years old 39%
   c. 46 – 65 years old 36%
   d. Over 65 years old 15%
2. Sex: Male 38% and female 62%
3. Educational Background
   a. Elementary Level or not graduated yet 9%
   b. Secondary Schools 55%
   c. Diploma/Academy 18%
   d. Graduate and upper 18%
4. Marital Status:Married89% and Unmarried 11%

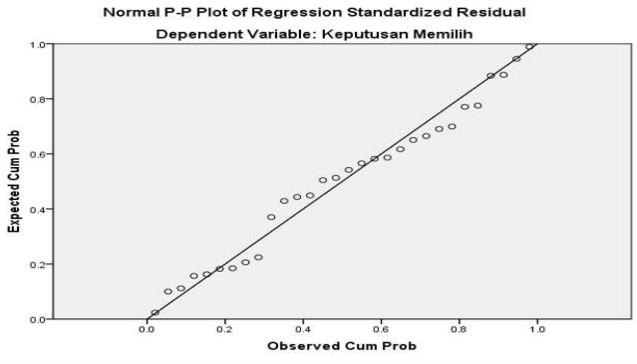
3.3. Validity, Reliability, and Normality Tests of the Instruments

The tests of validity, reliability and normality of the instruments were conducted before the research was being conducted. According to Riduwan (Riduan dan Kuncoro,2013) in order to find out the correlation coefficient validity of each item of the questionnaire, the critera is that if r_{cal} is higher than r_{table}, then the item is valid. On the other hand, if r_{cal} is lower than rt_{able}, then the item is invalid. With a level of trust of 90% and a significant level of 10% for the 30 respondents, it resulted in 0.463 for the $r_{table.}$.

The validity, reliability and normality were tested by using SPSS with a total of 30 respondents. Based on the validity test, it showed that 23 items of Decision Making , 14 items of Marketing-mix of Places, 29 items of Mix-Marketing of Promotion, 15 items of Marketing-mix of Process were valid in which,r_{cal} was higher than $r_{table}$and Pearson Product Moment result of 0.463 (n = 30 and =0.1).

The criterion for reliability test is if the value of Alpha Cronbach is higher than or similar to the minimum of 0.70, the instruments of the research are categorized as reliable or good (Rochaety, 2009). The reliability test of the research instruments showed the following value of Alpha Cronbach's for each variable: Decision Making with 0.938, Place or Location with 0.889, Peoplewith 0.951, Promotion with 0.960, and Process with 0.896. The result of each item, which was higher than 0.70, revealed that all items in the instrument were reliable.

Ghozaliexplained that normality test has the purpose to test whether, in a regression model, the residual variable has normal distribution. The residual value is said distributed normally if most of the values are closely related to the average value. In this study, graphic analysis was used to detect whether or not the residual was distributed normally(Ghozali, 2006).



Picture 1. Graphic of Normal P-P Plots of Regression Standardized Residual

Based on Picture 1, *normal P-P plots of regression standardized residual* presents dots which are spreading around the diagonal line and following the direction of that diagonal line. Thus, it can be concluded that this regression model shows a normal distribution pattern.

3.4. Hypothesis Testing

This research was conducted with 9 hypotheses with 2 alternative hypotheses i.e. H_0 and H_a (H alternative). The conclusions were based on the following test results:

a. If the probability value>0.1, then H_0 is accepted and H_a is rejected. It means that there is no significant influence of exogenous variable on endogenous variable
b. In contast, if the probability value<0.1, then H_a is accepted and H_0 is is rejected. If H_a is accepted, it means that there is a significant influence of exogenous on endogenous

The results of those 9 hypothesis testings are summarized in Table 2 which concludes that the hypothesis stated that there was a significant influence of marketing mix on the aspects of place, people, promotion and process was accepted (Ha was accepted).

1. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspect of Place on Customers' Decision Making in Choosing Hospitals

The calculation of this hypothesis testing showed that coefficient correlation R (Beta) was 0.558. Marketing-mix in the aspect of Place gave significant influence on decision making. The influence (Coefficient Determination) from Marketing-mix in the aspect of Place on decision making was Rsquare (correlation) = $(0.558)^2$x100%=31.1%. This result revealed that there was direct influence of Marketing-mix in the aspect of Place on decision making with a valueof 31%.

2. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspect of People on Customers' Decision Making in Choosing Hospitals

This testing showed a coeeficient correlation R (Beta) of 0.815. Marketing-mix in the aspect of People gave significant influence on decision making with anvalue of Rsquare(correlation)=$(0.815)^2$x100%=66.4%. This result described that Marketing-mix of the People aspect contributed 66.4% in giving significant influence on decision making.

Table 2. The Summary of Hypothesis Testings

The Influence among Variables	Path Coefficient (*Beta*)	The Value forProcal. Prob. cal	The Value of Refer.Pro	The Results
X1 Z	0.558	0.000	<0.1	Ha1accepted
X2 Z	0.815	0.000	<0.1	Ha2 accepted
Y1 Z	0.267	0.007	<0.1	Ha3 accepted
Y2 Z	0.700	0.000	<0.1	Ha4 accepted
X1X2Y1Y2 Z	0.817	0.000	<0.1	Ha5accepted
X1X2 Y1	0.328	0.004	<0.1	Ha6accepted
X1X2 Y2	0.847	0.000	<0.1	Ha7 accepted
X1X2 Z throughY1	0.816	0.000	<0.1	Ha8accepted
X1X2 Z throughY2	0.816	0.000	<0.1	Ha9accepted

3. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspect of Promotion on Customers' Decision Making in Choosing Hospitals

From this calculation testing, the coefficient correlation R (Beta) was found to be 0.267. The influence (Coefficient Determination) of Mix-marketing in the aspect of Promotion on decision making was Rsquare (correlation) = $(0.267)^2$x100%=7.1%. The results concluded that there was a

direct influence from Marketing-mix in the aspect of promotionon decision making with a valueof 7.1%.

4. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspect of Process on Customers' Decision Making in Choosing Hospitals

In this testing, cofficient correlation of R (Beta) of 0.700 was gained. Thus, marketing-mix of Process aspect gave direct influence on decision making with Rsquare (correlation) = $(0.700)^2$x100%=49.0%. To conclude, there was a direct significant effect of Process aspect of mix-marketing on decision making.

5. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspects of Place, People, Promotion and Process on Customers' Decision Making in Choosing Hospitals

This hypothesis testing gained a coefficient correlation of R = 0.817. It showed that marketing-mix in the aspects of Place, People, Promotion and Process had a very high correlation with decision making variable, with an R2 (coefficient determination) value of 0.667= 66.7%. This result revealed that all variables of marketing-mix, i.e. place, people, promotion and process gave 66.7% direct influence on decision making, while the other 33.3% referred to other variables which were not being investigated.

Based on the results of stastistic coefficient, linear regression of the fifth hypothesis is as follows:

Table 3.Coefficient Table ofHypothesis 5 Testing

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.980	6.274		1.431	.156
	Aspek Tempat	.036	.135	.022	.266	.791
	Aspek SDM	.866	.128	.750	6.752	.000
	Aspek Promosi	.014	.041	.021	.337	.737
	Aspek Proses	.090	.189	.053	.474	.637

a. Dependent Variable: Keputusan Memilih

$$Z=8.980 +0.036X_1+0.866X_2+0.014Y_1+0.090Y_2+0.577\varepsilon$$

6. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspects of Place and People on Promotion Aspect

From this hypothesis testing, it was found that the correlation (R) was 0.328 which showed that there was a strong correlation between mix-marketing of place and people aspects and promotion, while the influence of R2 (correlation determination) gained 0.108 = 10.8%.

7. Hypothesis Testing of Direct Influence of Marketing-mix in the Aspects of Place and People on Process Aspect

The result of the calculation of the correlation (R) testing gained 0.847, which showed that the correlation between the aspects of place and people on process aspect was very strong, while the influence of R2 (coefficient determination) was 0.717 = 71.7%.

8. Hypothesis Testing of Indirect Influence of Marketing-mix in the Aspects of Place and People on Customers' Decision Making in Choosing Hospitals through Promotion Aspect

This 8th hypothesis testing gained both coefficient correlation and coefficient determination of 0.816 which explained that the correlation between marketing-mix of the aspects of place and people on the customers' decision making through the aspect of promotion was very strong, while the influence of R2 (coefficient determination) was 0.666 = 66.6%, hence, this result presented that there was a very strong indirect influence from place and people aspects through promotion on decision making.

9. Hypothesis Testing of Indirect Influence of Marketing-mix in the Aspects of Place and People on Customers' Decision Making in Choosing Hospitals through Process Aspect

The results of coefficient correlation (R) resulted in a valueof 0.816,showing that there was a very strong correlation between marketing-mix in the aspects of place and people on the aspect of decision making, while the value of R2 (coefficient determination) was 0.666 = 66.6%. Thus, this result explained that there was a very strong indirect influence of place and people aspects through process aspect on decision making.

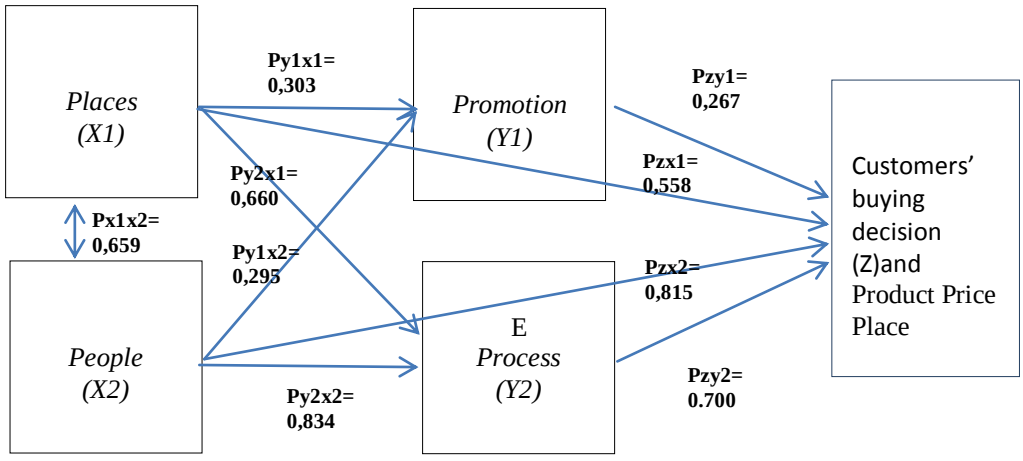
3.7. The Discussion of Path Analysis

Path analysis model in this research used 2 independent variables as exogenous variables, 2 dependent variables as endogenous variables, and 1 residual variable.. Exogenous variables consisted of marketing-mix in the aspects of Place (X1) and People (X2).Meanwhile the first exogen variable was Promotion aspect (Y1) and the second exogen variable was Process aspect (Y2), and the residual variable was Decision Making (Z), with Coefficient Correlation in Table 3. Both exogenous variables (Place and People) had significant effect on the intervening variables (Promotion and Process) and endogenous variable (Patients' Decision Making). Besides, both intervening variables (Promotion and Process) gave significant effect on the exogenous variable (Patients' decision making).

Based on the statistical analysis of the testing, the results with path coefficient of those two independent variables which influenced the dependent variables and residual variable was gained, so that the results of those path analysis testings could be created into linear model construction on the path diagram model.

The results of path analysis can be explained as follows:

a. The range of the influence of direct partial correlation of variables on Z starting from the highest to the lowest were as follow: People(X2), Process(Y2), Place (X1), and Promotion (Y1);
b. Total percentage of direct influence of X1, X2, Y1, Y2 on Z was 66.7%, meaning that all four variables contributed to the consideration of patients' decision making with a percentage of 66.7%, while the other 33.3% belonged to variables which were not measured in this study;
c. The biggest influence of indirect correlation of the variables on patients' decision making (Z) was path model X2 thorugh Y2;
d. The lowest influence of indirect correlation of the variables towards patients' decision making (Z) was path model X1 thorugh Y1



Picture 4. Path Diagram Structure

1. **Direct Influence of Marketing-mix of Place Aspect on Customers' Decision Making in Choosing Hospitals**

This research study described that there was a significant influence of Place aspect on the decision making of the patients with a correlation coefficient value of R (Beta) of 0.558 which

explained that this correlation was strong enough, with a direct influence of 31.1% and a total influence of 109.3% from both direct and indirect influences.

These results were in line with the research conducted by Kafa (2013) at PKU Muhammadiyah Kota Gede Hospital, Ali (2013) at Oupatients' department of Lung Hospital Dr. H.A. Rotinsulu Bandung. Based on the theory of Lovelock, (2007), Place, Cyberspace, and Time are variables which influence the decision of management on when, where and how to give the excellent service to customers. This is also in line with the theory of Kottler(1997) which argues that place/distribution is a set of organization which is interrelated involving in the process of providing a product of service to be used or consumed by customers.

The aspect of Place as the first independent variable in this study, was described through 3 dimension of review, i.e. transportation, pick-up point and the location of hospital. Place as the location of Vania Hospital was considered as a problematic reason for the patients to make decision to choose this hospital. It discussed the importance of street access to Vania Hospital Bogor which could be reached by public transportation, the availabilty of 24 hours public transportation services, traffic condition of Bogor City and the location of the hospital which could be reached by both public and personal transportation. By implementing appropriate strategies to anticipate problems in this aspect of Place, the decision of the patients to choose this hospital can be increased.

2. **Direct Influence of Marketing-mix of People Aspect on Customers' Decision Making in Choosing Hospitals**

This research study described a significant influence of People aspect towaronds the decision making of the patients with acorrelation coefficient R (Beta) value of 0.815 which explained that the correlation was very strongwitha direct influence of 66.4% and a total of direct influence of 129.9% from both direct and indirect influences.

These results were in line with the research conducted by Ullah (2011) who states that "Proper training for hospital personnels will be appealing for customers to have positive service experienced from private hospitals". Sari (2013) also shows that the quality of doctors give positive and significant inflences on the decision of having medication. Ali (2013) also proved that skilled and educated employees gave positive and significant influences on the decision to choose hospitals at the outpatients departments of Lung Hospital Dr. H.A. Rotinsulu. According to Elarabi (2014), management of human resources in healthcare institution is essential to enable the delivery of efficient and effective medical services and to achieve patient satisfaction. Bordoloi (2012) also mentions the importance of people management and knowledge management to deliver better services in healthcare.

These opinions were in line with Lovelock (2007) that the employees of a service institution are the most important factors at most high contact service providers in which they do direct and face-to-face interactions with customers and, to some extent, they can also influence their services in low contact situation. Peter (2000) has the same idea that a successful competition of organizations can be achieved by managing potential human resources they have. These human resources can be used as competitive excellent sources which are not easy to imitate by the competitors.

This result showed that qualified human resources at Vania Hospital will affect the decision taken by the patients to choose this hospital, both for inpatients and outpatients. The big value of determination coefficient towards the variable showed thathuman resources are the priority aspect.

3. **Direct Influence of Marketing-mix of Promotion Aspect on Customers' Decision Making in Choosing Hospitals**

This research study described that there was a weak influence of Promotion aspect towards the decision making of the patients with the correlation coefficient R (Beta) value of 0.267 which explained that the correlation was weak, resulted in adirect influence of only 7.1%.

This result supports the research result by Kafa (2013) that,in hypothesis testings, there was an influence of marketing-mix, including product, location, services and promotion on the decision of the patients to choose PKU Muhammadiyah Kotagede Hospital. A research by Ali (2013) also showed that promotion gave significant and positive influence on patients' decision making to choose Lung Hospital of Dr. H.A. Rotinsulu, while Rafdan (2015) claimed that the aspect of promotion gave positive and significant effect on patients' loyalty at Lung Poly-clinics Paru Batu.

Promotion is a communication activity of a product to persuade targeted customers to buy the product. Kotler (Kottler, 1997) states that an activity of promotion and education in service business should be seen in a wider context in managing all elements of 8P. Lovelock (Lovelock, 2007) says that promotion and educationare activities of communication and insentive design to build the perception of targeted customers of the company for special service that the company offers. Both Promotion and Education are the media to attract customers' and stakeholders' awareness on the products/services offered besides to reach targeted position. Lupiyoadi (2006) says that, "Promoting-mix covers several activities, as follow: advertising, personal selling, sales promotion, word of mouth, and direct marketing."

The result showed that the Promotion aspect gave significant and positive influences. However, among all aspects in this research, Promotion aspect had a small contribution. This might be caused by non-optimal promotion done by Vania Hospital when faced with various obstacles.

4. **Direct Influence of Marketing-mix of Process Aspect on Customers' Decision Making in Choosing Hospitals**

This research stated that correlation coefficient R (Beta) value of 0.7 revealed strong correlation and big direct influence with a value of 49%. This result is in line with research conducted by Kafa (2013)on ahypothesis testing showing that marketing-mix of Product, Location, Service and Promotion influenced customers' decision making in choosing PKU Muhammadiyah Kotagede Hospital with a significant probability value of 0.000. Ullah (2011) in his research said that "An established process to increase customer service experience need to be developed in every private hospital". In another study, Sanjaya (2015) also described that loyalty and business process are two influential aspects in frequency and monetary. It is inline with Olamide (2015), hospital administrators would be able to significantly improve the operational control and thus streamline operations. This would improve the response time to the demands of patient care because it automates the process of collecting, collating and retrieving patient information.

According to Lovelock (2007)' Process is an operational method and a set of actions needed to present products and services well to customers. In a service business, the participation of customers will determine the quality of an output leading to the success and enyjoyment of the customers to get expected services. This is also determined by the level of intensity, interaction and contacts between service providers and customers. Kotler (1997) proposed that strategy and deep creative marketing plan will lead the marketing activities. The development of effective marketing strategy needs mixed discipline and flexibility.

Process is the unity of all activities, generally it consists of procedure, time-schedule, mechanism, activities, and other routines, where the service is made and given to the customers.In this research, the aspect of Process gave the second biggest influence after People, so that it is considered important to optimize process aspect as the reference to support customers in choosing references in the service procedures, service schedule, and service activities. Service procedure expected by the customers showed that Vania Hospital management was consistent in applying its standard operational procedure. As a result, various choices were offered to the customers to choose. Besides, fixed service time will also give the customers motivation to choose such as doctor visit time, shift rotation among medical staff, and counter opening schedule. Thus, this well-managed condition will stimulate the patients to make up their decision to choose Vania Hospital Bogor.

5. **Direct Influence of Marketing-mix of Place, People, Promotion and Process Aspects on Customers' Decision Making in Choosing Hospitals**

This research found that there wasa significant influence of Place, People, Promotion and Process of Marketing-mix aspects on customers' decision in choosing hospitals with R (Beta) correlation coefficient of 0.817 which explained that the correlation was very strong and resulted in 66.7% of influence.

The findings were supported by research by Ali (2013) which found both marketing-mix and service quality of marketing mix gave positive and significant influences on the decision of customers to choose Outpatient Lung Hospital of Dr. H.A. Rotinsulu. AsLita (2006) mentioned in her research that service marketing mix of promotion, place, physical evidence, process and people simultaneously influenced the process of tourists in choosing tourism places.

Tjiptono (2005), further explains that if the customers are satisfied with the performance of the service marketing-mix, they will buy and/ or use the services repeatedly.The customers' decisions of choosing Vania Hospital Bogor can be taken by considering the aspects comprised in marketing-mix so that in making any decision, the customers firstly pay attention to the 4 aspects, i.e. Place (X1), People (X2), Promotion (Y1) and Process (Y2). By improving those 4 aspects and the correlation among those 4 aspects, the customers' decision to choose Vania Hospital can be increased.

6. **Direct Influence of Marketing-mix of Place and People Aspects on Promotion Aspect**

This research found that there was a significant influence of Place, People, Promotion and Process of Marketing-mix aspects on customers' decision in choosing hospitals with R (Beta) correlation coefficient of 0.328 which explained that the correlation was strong enough and resulted in direct influence of 10.8%.

The correlations among all aspects in marketing-mix both directly and indirectly in line with research by Abubakar(2005), which presented that mix-marketing of promotion aspect done by an industry of herbs in Banda Aceh significantly contributed to the process of customers in making decision to buy the products. The process of the customersto buy products in herbs industry had a value of 28.60%, and it directly and indirectly influencedthe product, price, and promotion. Ma'rufah (2015) proved that the variables of products, price, promotion, place/distribution, and physical evidence positively and significantly influenced the decision of purchasing potato chips.

Zeithaml (2013) explained that traditional marketing mix concept consisted of 4P, i.e. Product, Price, Place (distribution) and Promotion, while service marketing-mix covered expanded marketing-mix, namely the people, physicalevidence, and process in which all these aspects are correlated and interrelated one to another. The correlation between People and Promotion is explained by Lovelock (2007) who stated that the marketing process is done through personal communication among personal sellings and customer service. Main job of customer service covers creating and giving services in front of customers by providing information, accepting order and payment, and solving problems.

7. **Direct Influence of Marketing-mix of Place and People Aspects on Process Aspect**

This research proved that there was a significant influence of marketing-mix of place and people aspects on the process aspect. The calculation of the research resulted in anR (Beta) correlation coefficient of 0.847, meaning that the relationship among these aspects was very strong with 71.7% of influence.

The relationship among the aspects of this marketing-mix directly and indirectly supported by the research conducted by Abubakar(2005), which found that the marketing-mix of place aspect implemented by herbs industry had significant effects on the customers' process of making decision in Banda Aceh (23.16%), both directly and indirectly through the mixing of products, price, and place. A research study conducted by Ma'rufah (2015) showed that the variables of products, price,promotion, place/distribution, and physical evidence gave positive and significant effects on the decision of buying potato chips in Agronas Gizi Food, while the variables of people and process gave positive effect but not significantlyon the purcashing decision.

Lovelock (2007)says that the customers expect the employees of service providers to follow certain rules and the disobedienceof the rules will decrease the level of customers' satisfaction. The employees should be carefully selected, trained, and paid to handle effective service delivery. Kotler and Amstrong (2009) give their opinions that place/distribution is a set of organization which depends on each other in the process of providing a product or service to be used by the customers of business users.

8. **Indirect Influence of Marketing-mix of Place and People Aspects on Customers' Promotion Aspect in Choosing Hospitals through Promotion Aspect**

This research mentioned that there was a significant influence of marketing-mix of place and people aspects on decision making through the aspect of promotion, resulting inan R (Beta) correlation coefficient of 0.816 which showed a very strong relationship with an indirect influence of 66.6%.

The relationship among aspects in this marketing-mix was in line with a study done by Abubakar (2005), which found promoting-mix by herbs industry gave significant effects on the customers' process of decision making in Banda Aceh (28.60%) both indirectly and indirectly through the mixing of products, price, and place. Furthermore, it directly and indirectly gave

influences to product, price, and promotion. Ma'rufah (2015) proved that the variables of products, price, promotion, place/distribution, and physical evidence positively and significantly influenced the purchasing decision of potato chips.

Zeithaml (2013) explained that traditional marketing mix concept consisted of 4P,i.e. Product, Price, Place (distribution) and Promotion, while service marketing-mix covered expanded marketing-mix, namely the people, physicalevidence, and process in which all these aspects are correlated and interrelated one to another

9. **Indirect Influence of Marketing-mix of Place and People Aspects on Customers' Promotion Aspect in Choosing Hospitals through Process**

This research revealed that there was a significant influence of marketing-mix of place and people aspects on decision making through the aspect of process. The calculation resulted inan R (Beta) correlation coefficient of 0.816 which showed a very strong relationship with an indirect influence of 66.6%.

The relationship among aspects in this marketing-mix was directly and indirectly in line with research by Abubakar (2005) , which found that place aspect used by herbs industry had a significant effect in the process of customers' decision making at herbs industry in Aceh (38%) both directly and indirectly through the mixing of products, price and place. Ma'rufah (2015) proved that the variables of products, price, promotion, place/distribution, and physical evidence positively and significantly influenced the purchasing decision of potato chips while other variables of People and Process also gave positive influence but not that significantly.

Zeithaml (2013) explained that traditional marketing mix concept consisted of 4P,i.e. Product, Price, Place (distribution) and Promotion, while servicemarketing-mix covered expanded marketing-mix, namely people, physicalevidence, and process in which all these aspects are correlated and interrelated to one another.

Halter said that, according to Lovelock(2007), there are three functions of management which play an important role and dependant on one another to fulfill the customers' needs, i.e. marketing, process, and people.

By looking at the linear regression between the aspects of Place, People and Process towards Customers' decision making in choosing hospitals, it showed that the aspects of place, people, and process should be improved one by one so that the decision of the customers about the hospital can be increased.

The research proved that there was a significant influence of the 4 marketing mix aspects over the decision making of the customers to choose the hospital both directly and indirectly. It also showed the elationship among independent, variables and residual variables, so that the causality of those relationships can build a cause and effect relationship. This cause and effect relationship happened if the 4 aspects of marketing mix are improved for the customers' decision making to choose Vania Hospitel Bogor. The prediction of the improvement of customers' decision in choosing Vania Hospital Bogor can be seen in the following equation:

$$Z= 0.022X1+0.750X2+0.021Y1+0.053Y2+0.333Ɛ$$

That linear regression can show the existance of prediction from the four aspects of marketing mix or, in other words, if the 4 aspects of marketing mix are improved simultaneously, thecustomers' decision of choosing Vania Hospital Bogor can be increased.Thus, it is very important for Vania Hospital to prioritize the aspect of people through the indicators of employees' education levels, period of working, fast response towards problems, workers' initiative, workers' empathy, knowledge and skill. Those aspects arethe aspects thatthe hospital must consider to give satisfying services to customers and make them loyal customers.

5. **CONCLUSION**

Several conclusions are proposed in this research:

a. There was a direct significant effect of place aspect on the decision making (31.1%).
b. There was a direct significant effect of people aspect on the decision making (66.4%).
c. There was a direct significant effect of promotion aspect on the decision making (7.1%).
d. There was a direct significant effect of process aspect on the decision making (49.0%).
e. There was a direct significant effect of place, people, promotion and process aspects on the decision making (66.7%).
f. There was a direct significant effect of place and people aspects on the promotion aspect (10.8%).

g. There was a direct significant effect of place and people aspects on the process aspect (71.7%).
h. There was an indirect significant effect of place and people aspects on customers' decision making in choosing hospitals thorugh the promotion aspect (66.6%).
i. There was an indirect significant effect of place and people aspects on customers' decision making in choosing hospitals thorugh the process aspect (66.6%).

Based on the conclusions above, the suggestions given by the researchers are as follow:

a. It is expected that the management of Vania Hospital Bogor apply marketing-mix in the aspects of people, process, place and promotion in order to support the improvement of customers' decision making of Vania Hospital Bogor.
b. Both People and Process are 2 aspects with strong enough coefficient and should become the priority for the improvement of the hospital since they may be the reasons for the patients to choose RS. Vania. It is suggested for the management and leaders of Vania Hospial Bogor to run evaluation visits periodically as the output of marketing-mix strategy in the aspects of people and process

REFERENCES

Abubakar, R. 2005. Pengaruh Pelaksanaan Bauran Pemasaran terhadap Proses Keputusan Pembelian Konsumen pada Jamu di Banda Aceh. *Jurnal Sistem Teknik Industri Volume6.http://repository.usu.ac.id/bitstream/123456789/15887/1/sti-jul2005-%20(9).pdf*

Ali, N. dan Hussain, D.2013. Pengaruh Bauran Pemasaran dan Kualitas Pelayanan terhadap Keputusan Memilih Rumah Sakit. Studi Empiris pada Instalasi RawatJalan Rumah SakitParuDr.H.A. RotinsuluBandung.*AliansiJurnal Manajemen dan Bisnis*. 2013, Mei. *http://ejurnal.stimaimmi.ac.id/JURNAL_VOL.8_NO.15_MEI_2013.pdf*

Badan Pusat Statistik Kota Bogor. 2015. *Kota Bogor Dalam Angka Bogor* (*City in Figures*). *http://bogorkota.bps.go.id/new/website/pdf_publikasi/Kota-Bogor-Dalam-Angka-2015.pdf*

Bloom, P.&Boonie L.2006.*Strategi Pemasaran Produk*. Jakarta: Prestasi Pustaka Raya.

Bordoloi P and Islam N, 2012. Knowledge Management Practice and Healthcare Delivery a Contingency Framework. *The Electronic Journal of Knowledge Management vol 10 issue 1, 2012. www.ejkm.com*

Dinas Kesehatan Kota Bogor.2015.*Profil Dinas Kesehatan Kota Bogor tahun 2015*. Bogor.

Elarabi HM and Johari F, 2014. The impact of Human Resources Management on Health Care Quality. *Asian Journal of Management Science and Education, Vol 3 No 1, Jan 2014*

Ghozali,Imam., 2006.*StatistikNonparametrik*, Semarang:Badan Penerbit UNDIP

Kafa,R.,2013.Pengaruh Bauran Pemasaran Jasa terhadap Keputusan Pasien dalam Memilih Jasa Rumah Sakit. Rumah Sakit PKU Muhammadiyah Kotagede Jogjakarta 2013. *Jurnal Ekonomi dan Bisnis Islam*| Vol. VIII,No.1.(2013, Desember). *http://journal.uin-suka.ac.id/jurnal/detail/377/pengaruh-bauran-pemasaran-jasa-terhadap-keputusan-pasien-dalam-memilih-jasa-rumah-sakit-studi-pada-pasien-rumah-sakit-pku-muhammadiyah-kotagede*

Kotler, Philip.&Keller, K.1997.*Marketing Manajement "Analysis,Planning, Implementation and Control".* 9th ed. New Jersey : Prentice Hall International,Inc.

Kotler, Philip &Amstrong, G.2009. *Principles ofMarketing*. USA : PrenticeHall.

Lita,R. 2006. Pengaruh Pelaksanaan Bauran Pemasaran Jasa sebagai Keunggulan Bersaing terhadap Proses Keputusan Wisatawan Mengunjungi Objek Wisata di Kota Padang. *http://repo.unand.ac.id/1745/1/abstrak_08_Verinita%252C_SE.%252C_MSi..Pdf*

Lovelock,Cristoper.,Wirtz,J.&Chew,P.2007.*EssentialsofSevicesMarketing*. Singapore:PrenticeHall.

Lupiyoadi,Rambat dan Hamdani. 2006. *Manajemen Pemasaran Jasa*. Edisi Kedua. Jakarta: Salemba Empat

Ma'rufah, Deoranto, dan Silalahi. 2015. Analisis Pengaruh Bauran Pemasaran terhadap Keputusan Pembelian Keripik Kentang Agronas Gizi Food dengan Metode Structural Equation Modelling(SEM). *skripsitipftp.staff.ub.ac.id/files/2014/10/JURNAL-Nur-Amalia-Ma'rufah.pdf*

Olamide O, Adedayo E, Abiodun A, 2015. Design and Implementation of Hospital Management System Using Java. *IOSR Journal of Mobile Computing & Application vol 2, issue 1, Mar-Apr 2015.*

Peter, J. Paul danJerryC. Olson. 2000.*Perilaku Konsumen dan Strategi Pemasaran*. (Damos Sihombingdan PeterRem Yossi Pasla,Penerjemah).Jakarta: Erlangga

Rafdan,N.2014-2015.Pengaruh Bauran Pemasaran terhadap Loyalitas Pasien di Poliklinik Paru Rumah Sakit Paru Batu. *Jurusan Manajemen Fakultas Ekonomi dan Bisnis Universitas Brawijaya. 2015,April*. *file:///C:/Documents%20and%20Settings/dr-Tri/My%20Documents/Downloads/763-2010-1-PB.pdf*

Riduan dan Kuncoro,2013.*Cara Menggunakan dan Memakai Path Analysis (AnalisisJalur)*. Alfabeta: Bandung.

Rumah Sakit Vania. 2014. *Profil Rumah SakitVania*. KotaBogor.

Rochaety, Tresnati, R., Latief. A. 2009. *Metodologi Penelitian Bisnis dengan Aplikasi SPSS*. Jakarta: MitraWacanaMedia.

Sabarguna BS, 2008. Analisis Pemasaran Rumah Sakit. Konsorsium Rumah Sakit Islam Jateng-DIY

Sangadji dan Sopiah, 2013, *Perilaku Konsemen-Pendekatan Praktis disertai Himpunan Jurnal Penelitian*, Yogyakarta: Andi Offset

Sari,Putri Cahyaningrum. 2013. Faktor-faktor yang Mempengaruhi Keputusan Berobat serta Dampaknya terhadap Kepuasan Pasien. *Diponegoro University Institutional Repository*.2013, Juli. *http://eprints.undip.ac.id/39566/*

Sanjaya, R., Sumarwan. 2015. Hubungan Customer Relationship Management dengan Loyalitas Nasabah (Studi Kasus: PT Bank XYZ Cabang Bogor). *Manajemen IKM*. *http://journal.ipb.ac.id/index.php/jurnalmpi/*

TheWorld Bank.2014.*World Development Indicators:Health Systems*. *http://data.worldbank.org/indicator/SH.MED.BEDS.ZS*

Tjiptono,F.,Gregorius,Chandra.2005.*Service,Quality&Satisfaction*.Yogyakarta: Andi Offset

Ullah,G.M. Shafayet.2011.Factors Influencing Consumer Service Experience in Private Hospitals:AStudy from Bangladeshi Perspective*. Interdisciplinary Journal of Contemporary Research in Busines. Institute of Interdisciplinary Business Research, VOL3, NO 5*. (2011), Sep). *http://journal-archieves8.webs.com/138-147.pdf*

Undang-Undang Republik Indonesia nomor 44 tahun 2009 tentang *Rumah Sakit*. 2009. Kementrian Kesehatan Republik Indonesia.

Zeithaml,Valerie,Mary,Gramler.2013.*Service Marketing*.International edition. McGrawHill.

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The Correlation Between Birth Spacing and Low Birth Weight Cases

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Article Info

Keyword:

Birth Spacing,
Low Birth Weight,
Premature,
Pregnancy.

ABSTRACT

A number of factors could cause low birth weight, such as mother with premature and low birth weight history, malnutrition during pregnancy, mother's age, pregnancy and birth spacing, maternal diseases, pregnancy factors, fetus factors, and habitual factors. Baby birth weight of less than 2.500 gram could have the risk of having child with physical and mental disorder that eventually will effect on the child intelligence. Low birth weight is also one of the factors of infant mortality during perinatal period. This study aims to measure the correlation between birth spacing and LBW cases using chi – square test. The population of this study are all babies who were born on January to December 2016. The result shows that gap between pregnancies under two years correlates with LBW. Under two years, the uterus and maternal health has not yet recovers. Another pregnancy, will cause poor fetal growth and low birth weight (LBW).

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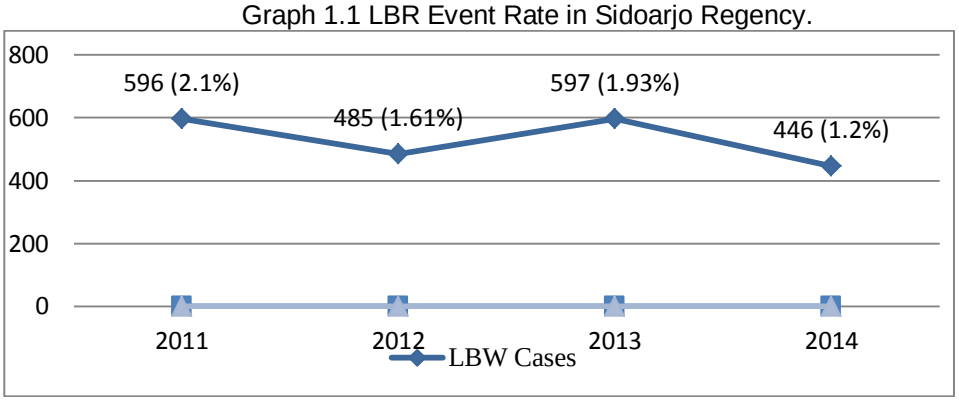
1. INTRODUCTION

Low birth weight or LBW are "babies born under the weight of 2,500 grams". The causes of LBW are maternal factors (previous birth with premature and LBW history), malnutrition during pregnancy, maternal age (age less than 20 years and over 35 years), too close pregnancy spacing and birth, mother's chronic illness (hypertension, heart and vascular disorders), pregnancy factors (hydramnios, multiple pregnancy, and pregnancy complications (preeclampsia, eclampsia, and premature rupture)), fetal factors (congenital abnormalities, uterine infections, and congenital anomalies), and habits (work, smoking, environmental factors) (Ridha, 2014)(Maryunani, 2013).

The impacts of infants weighing 2,500 grams or less are such asphysical and mental disorders as well as other serious impacts that can inhibit the growth and mental development of the children. LBW is one of the risky factors of infant mortality during perinatal period because it affects the declining of intelligence (Amiruddin, 2014).

To reduce the incidence of LBW, the government launched a program on nutrition improvement towards healthy Indonesia in 2010, increased the coverage of antenatal visit, increased the coverage of neonatal visit, conducted a gold program in 2012, and others.The results of Riskesdas in 2013 showed that the percentage of infants with LBW was 10.2%. The highest percentage of LBW was in Central Sulawesi Province (16.8%) and the lowest percentage was in North Sumatera Province (7.2%). Based on the result of 2015 health profile in Sidoarjo Regency in 2014, there were 446 (1.2%) LBW, in 2013 there were as many as 597 babies (1.93%), in 2012 there were485 babies (1.61%) of all live births which slightly decreased compared to the year 2011 in which the number of BBLR were 596 babies (2.1%) of all live births (KepMenKes RI, 2013).

Graph 1.1 LBR Event Rate in Sidoarjo Regency.



Based on a study by Sari (2015), from January 2015 to June 2015, there were 81 (42%) LBW out of 191 deliveries. Based on the data, the rate of LBW at RSIA Kirana Sepanjang Sidoarjo is still high compared to the government's target of 10.2% in 2013. Some of the problems of LBW that can interfere with the infants are such as hypothermia, asphyxia, hyperbilirubin, and respiratory syndrome, which are interesting for further research (Nurmalasari, 2014).

2. RESEARCH METHOD

This research uses analytical research method using Chi Square Tests test. The population of this study were all infants born at RSIA Kirana Sepanjang in January 2016 until December 2016. The entire population was subjected to the study with these criteria: the mothers have no history of premature birth and LBW, normal LILA (≥ 23.5 cm), maternal age excluded risk category, the mothers have no chronic diseases such as hypertension and heart disorders, no hydramnios, single pregnancy, and no complications of pregnancy (preeclampsia, eclampsy, and KPD), non-heavy-duty mothers recorded in medical records.

Data collection was done with secondary data retrieval. The secondary data was taken from medical record at RSIA Kirana Sepanjang. The collected data was recapitulated in the recapitulation table and then data management was performed and presented in the form of frequency table, and the cross-table was analyzed descriptively by performing statistical test to know the relation of birth spacing to the occurrence of LBW. The research period was started from October 2016 until April 2017, and the data retrieval was started in February 2017. The place of study was conducted at RSIA Kirana Sepanjang.

3. RESULTS AND ANALYSIS

3.1 Characteristics of Parity, Occupation, Education, and Respondents' Age

Table.1 Parity Frequency Distribution

Parity	Total	Percentage (%)
Primipara	37	56.06
Multipara	29	43.93
Total	66	100
Occupation	**Total**	**Percentage (%)**
Work	25	37.87
Not working	41	62.12
Total	66	100
Education	**Total**	**Percentage (%)**
Low	10	15.1
Middle	45	68.1
High	11	16.8
Total	66	100
Age	**Total**	**Percentage (%)**
Risky	29	43.93
Not Risky	37	56.06
Total	66	100

Source: Medical Record January 2016-December 2016.

Table 1 shows the mothers giving birth at RSIA Kirana, for the most part (56.06%) the parity is primipara (a woman giving birth for the first time), most (62.12%) are not working, mostly (68.1%) obtain secondary education, and most (56 , 06%) of the age is not at risk.

3.2 Description of Birth Frequency Distribution at RSIA Kirana Sepanjang

Table.2 Frequency of Birth at RSIA KiranaSepanjang

Birth Spacing	Total	Percentage(%)
Primi	66	31.3
< 2 Years	49	23.2
≥ 2 Years	96	45.5
Total	**211**	**100.0**

Based on Table.2, the frequency of birth spacing at RSIA Kirana Sepanjang showed that almost all birth at RSIA Kirana Sepanjang is on birthspacing≥2 years that is equal to 96 (45.5%). This corresponds to the theory that the child's age from 27 to 36 months is a safe birth spacing between one child and the other. At this spacing, the mother is most likely to have healthy babies and survive as they pass through the process of pregnancy. This is because the reproductive function has returned to normal. If the next pregnancy can function normally, the growth and development of the baby can be more optimal. At RSIA Kirana Sepanjang, almost births are> 2 years apart, this is probably because the mother has used contraception and obtained information about the ideal pregnancy spacing from various sources so that the mother can set a safe birth spacing.

While the pregnancy with birth space distance <2 years can be at risk especially on the mother because it increases the risk of bleeding after birth and the mother's womb is not ready to be the place of implantation by the fetus. In addition, maternal age factor is also an important factor in determining the birth spacing. If the age is less than 30 years and there are no health problems, the pregnancy might have the ability to adjust to the birth spacing (Siswosuharjo,2010).

3.3 Description of Frequency Distribution of LBW Occurrence at RSIA Kirana Sepanjang

Table.3 Frequency of LBW Occurrence at RSIA Kirana Sepanjang

LBW	Total	Persentase (%)
LBW	130	61.6
Not LBW	81	38.4
Total	**211**	**100.0**

Table.3 shows that most maternity mothers at RSIA Kirana Sepanjang givebirth to baby with BBLR which is equal to 130 (61.6%). The high number of LBW incidents at RSIA Kirana Sepanjang is due to the fact that RSIA Kirana is a referral hospital equipped with complete health equipment and obgyn and child specialist doctors. Infants with LBW have high risk of infant mortality, especially during perinatal period and LBWcan seriously impact the quality of future generations since it will inhibit the growth and mental development of the children and also decrease their intelligence (Amiruddin, 2014).

In conclusion, low birth weight (LBW) is the case in which a baby is born with a weight less than 2,500 grams. The causes of LBW are maternal factors (previous birth with previous premature and LBW history), lack of maternal nutrition during pregnancy, maternal age (less than 20 years and over 35 years), too close pregnancy and birth spacing, maternal illness (hypertension, heart and vascular disorders), pregnancy factors (hydramnios, multiple pregnancy, and complications of pregnancy (preeclampsia, eclampsia, and premature rupture), fetal factors (congenital abnormalities, uterine infections, and congenital anomalies), and work, smoking, environmental factors (Ridha, 2014)(Maryunani, 2013).

3.4 The Correlation Between Birth Spacing to LBW Occurrence at RSIA Kirana Sepanjang

Table 4 Relation of Birth Spacing to LBW Occurrence

		BW		Total
		LBW	Not LBW	
Birth Spacing	< 2 Years	41	8	49
		83.6 %	16.4 %	100 %
	≥2 Years	60	36	96
		62.5 %	37.5 %	100 %
Total		101	44	145
		69.6 %	30.4 %	100 %

Chi Square Tests (p = 0.009< α = 0.05)

Table 4 shows that infants born with LBW are mostly (83.6%) with the birth spacing of <2 years compared to infants born with≥ 2 years spacing, whereas infants who are not born with LBW are almost partially (37.5%)with the birth spacing of≥2 years compared to babies born within <2 years. This shows that the shorter the pregnancy spacing, the higher incidence of LBW. In Chi Square Tests analysis, p = 0.009 <α = 0.05), which means that H0 is rejected and H1 is accepted, i.e. there is a relation between pregnancy spacing with the occurrence of LBW.

In accordance with other research, the results indicate that the gestational spacing of less than 2 years will increase the risk of LBW by 1,414 times compared to the spacing of pregnancy of more than 2 years. It is because women pregnant in less than 2 years after birth, the condition of the maternal womb has not returned perfectly. Therefore, the mechanism of nutrition to the fetus will experience a disturbance which can indirectly affect the baby's weight. To prevent pregnancy, contraception (KB) can be used to reduce unwanted pregnancy, especially if the spacing of pregnancy is too close. (Manuaba,2012)(Yanti, 2013).

4. CONCLUSION

The conclusion of this research is that there is a correlation between pregnancy spacing to LBW. It is expected that health workers can provide counseling to pregnant women to plan their pregnancies with a spacing of more than 2 years and if there are pregnant women with a gestational spacing of less than 2 years, they should recommend routine pregnancy check and anticipate the occurrence of LBW.

ACKNOWLEDGEMENTS

Let us to express our gratitude to:

a. The Rector of Muhammadiyah University of Sidoarjo which has given opportunity for the researchers to conduct research.
b. The Dean of Health Sciences Faculty who has granted a research permit.
c. The Director of Matana Ibu and Anak Hospital Kirana who has given research place permit.
d. The Institute of P3i Muhammadiyah University of Sidoarjo for the support to the researchers in the form of plagiarism research article checking.
e. All parties for the assistance in the preparation of this research, either directly or indirectly.

REFERENCES

Amiruddin, R dan Hasmi. 2014. *Determinan Kesehatan Ibu dan Anak*. Jakarta. Trans Info Media

KepMenKes RI, 2013. Riskesdas 2013.

Manuaba, I.G.B. 2012. *Ilmu Kebidanan, Penyakit Kandungan, dan KB untuk Pendidikan Bidan Edisi 2*. Jakarta. EGC

Maryunani, A dan Puspita, E. 2013. *Asuhan Kegawatdaruratan Maternal dan Neonatal*. Jakarta. Trans Info Media.

Nurmalasari, D. 2014. *Gambaran Faktor Resiko Bayi Berat Lahir Rendah di Rumah sakit Pusat Fatmawati.*http://repository.uinjkt.ac.id/dspace/bitstream/123456789/25534/1/Diana%20Nurmalasari%20-%20fkik.pdf

Ridha, N. 2014. *Buku Ajar Keperawatan Anak*. Yogyakarta. Pustaka Pelajar

Siswosuharjo, Suwignyo. 2010. *Panduan Super Lengkap Hamil Sehat*. Penebar Plus. Jakart

Yanti Eka M, 2013. *Hubungan Usia dan Jarak Kehamilan dengan Kejadian Berat Badan Lahir Rendah (BBLR) di RSUD Penembahan Senopati Bantul Yogyakarta.* http://digilib.unisayogya.ac.id/955/1/Naskah%20Publikasi.pdf

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Implementation Analysis of Interactive Learning Media in Improving Laboratory Skills on Midwifery Course in Health Sciences High School in Pemkab Jombang

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Article Info

Keyword:

Interactive Learning Media,
Laboratory Skills,
Midwifery Course.

ABSTRACT

Quality teaching and learning process is very determine the mastery of competence learners who ultimately determine the quality of graduates. Competence of learners needs to be assessed or evaluated using appropriate methods. Weak learning process is one of the problems faced in education. The process of learning in the classroom just leads the child's ability to memorize the given material. While most of the learning models applied in teaching and learning activities only focus on improving the cognitive abilities of learners. Therefore, the researchers intend to apply the learning model using interactive learning media to improve laboratory skills for midwifery subjects. This study used classroom action research of implementation on interactive learning media. The subjects of this research were all DIII midwifery students of 2nd semester, 40 students. To obtain more accurate data then in this study using laboratory checklist. Statistical analysis was performed using the t-paired test hypothesis by assuming the variance of both groups equal (equal variances assumed). Because of t calculated> t table (16.18> 1.68) or p <0.05 so it is concluded that there are significant differences between the value of learning outcomes by interactive methods and the value of learning outcomes by conventional methods. The score of learning with interactive method is higher than the score of learning with conventional method, so it can be concluded that the application of interactive learning model has significant effect to the value of laboratory skills of Midwifery Course Students

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1. INTRODUCTION

Laboratory skill or skill assessment should include preparation, process, and product. Assessment can be done at the time the process takes place that is when the students do the practice, or after the process takes place by testing the learners. The development of information technology is so rapid that it gives a big impact on the teaching materials, one of which is an interactive CD. This teaching material has a variety of forms, including game, problem solving, and other forms of materials. This is certainly a positive effect of information technology for education. Responding to the development, we, as educators, are expected to be agents of change and should not be left behind with new learning technology. Educators must be able to present creative, innovative, and adaptive teaching materials, so that the learning activities can take place effectively and efficiently.

Interactive multimedia is the media that have a controller tool that can be run by users who use the media, so that users can choose their own desired material. According to Sanjaya (2012), in studying one topic of discussion, students can choose which will be studied first.

Benefits of using interactive multimedia are as follow: interactive multimedia is more dynamic so it is not boring; interactive multimedia provides more diverse menu choices so that students as media users have the opportunity to choose the preferred menu option; more extensive subject materials enable interactive multimedia to have a greater diversity of materials that students can understand; feedback can be given in various ways so as to improve learning motivation.

Practicum in the laboratory aims to improve the understanding of the theory obtained during lectures and tutorials or to improve skills in a particular field. The practice implementation can be integrated. The general purposes of the laboratory practicum are for students to improve their understanding of the theories that have been studied in lectures and through independent learning; to explain the difference between what is expected and how the reality is; to interpret the results of the lab with experiments; to compare the results of the group with those of other groups; to apply scientific honesty by reporting the results obtained in the lab as it is.

Pregnancy midwifery course is one of the subject that must be mastered by DIII midwifery graduates, where this course trains the learners to be able to provide midwifery care to normal pregnant women by considering aspects of culture based on concepts, attitudes, skills and evidence-based results in antenatal practice using a midwifery management approach that focuses on preventive and promotional efforts as an early detection of complications. Midwifery course focuses most on skills in providing care to patients. Meanwhile, most of the learning models applied in teaching and learning activities only focus on improving the cognitive abilities of learners. Therefore, the researchers intended to apply a learning model by using interactive learning media to improve laboratory skills in midwifery subjects. The research purpose of this study is to analyze the effects of interactive learning media on laboratory skills on midwifery course.

2. RESEARCH METHOD

This study was classroom action research because researchers acted directly in the study, from the beginning to the end of the action. The subjects of the study were all 2nd semester DIII midwifery students with a total of 40 students. The sample selection was done by using simple random sampling technique. To obtain more accurate data, this study used laboratory checklist. This research was conducted during the teaching and learning process of pregnancy course in 1 semester and attempted to calculate the difference or the increase in the learning ability. Statistical analysis was performed using the t-paired test hypothesis by assuming the variance of both groups as equal (equal variances assumed).

3. RESULTS AND ANALYSIS

Assessment Laboratory skills

This description is done based on the variables studied consisted of the test scores of laboratory skills of the students in the group with conventional learning methods and that of the students in the group taught with interactive learning media.

3.1 Characteristic Values of Laboratory Skills in Conventional and Interactive Learning Media Groups

Table 1. Characteristic Values of Laboratory Skills

Description	∑ students	Percentage (%)
Conventional Group		
Value ≥ 78.85(mean)	15	38
Value ≤ 78.85 (mean)	25	62
Interactive Media Learning Group		
Value ≥ 85,15 (mean)	30	75
Value ≤ 85,15 (mean)	10	25

Source: Primary Data 2017

Table 1 shows that, the average score of students taught with interactive learning media, in terms of laboratory skills, had a higher mean value than that of the students taught with conventional model learning. The learners who had an above average score were mostly from the group taught using interactive learning media.

3.2 Descriptive Statistics of Laboratory Skills in Midwifery Course in Conventional Groups and Interactive Learning Media Groups

Table 2. Descriptive Statistics of Laboratory skills in Midwifery Course in Conventional Groups and Interactive Learning Media Groups

No	Description	Min. value	Max. value	*mean*	∑ students
1	Laboratory Skills of Conventional Group	75	82	78.85	40
2	Laboratory Skills of Interactive Learning Media Group	81	90	85.15	40

Source: Primary Data 2017

Table 2 shows that the maximum value in the interactive learning media group was higher than that of the conventional group. Accordingly, the minimum value of the interactive group was at 81, which was higher than that of the conventional group which was at 75.

3.3 Influence Analysis Application of Interactive Learning Model

a. Pre-requisite Analysis

The data analyzed using t-test has pre-requisite test in parametric statistic that is normally distributed data. Therefore, it is necessary to test the data normality. In this study, the normality test was done with kolmogorov-smirnov test method.

Table 3. Test of Normality of Laboratory Skills in Conventional and Interactive Learning Media Groups

	One-Sample Kolmogorov-Smirnov Test
Kolmogorov Smirnov	1.147
Asymp. Sig. (2-tailed)	0.144

Table 3 shows that the significance value of 0.144 is greater than 0.05 so it can be concluded that the data is normally distributed, so we can proceed with the analysis with t-paired test statistics.

b. Bivariate Analysis

After the pre-requisite test in the parametric statistics and the data is proven to be normally distributed, then the data can be analyzed by using t-paired test. Here is the result of t-paired test calculation by assuming the variance of both groups as equal (equal variances assumed).

Table 4. Test Result Statistics t-paired test.

Learning method	t	df	*p*
Conventional *Interactive*	16.18	39	0,000

Based on Table 4, it is known that the value of laboratory skills of learning outcomes taught with interactive learning method was greater than the value of learning outcomes with conventional methods, thus providing a positive difference. This shows that the score of learning result with interactive method is better than the value of learning result with conventional method. The statistical test on the difference resulted in a t-value of 16.18 with a significance (p) of 0.000. The testing was done with degrees of

freedom (df) of 39 and at a level of significance of 5% so that the value obtained of t¬nable was 1.68. Comparison of $t_{calculated} > t_{table}$ (16.18> 1.68) or $p < 0.05$. Therefore, it is decided that H_0 is rejected and H_a is accepted. Thus, it is concluded that there is a significant difference in the score of laboratory skills between the learning outcomes taught with interactive methods and those with conventional methods. Therefore, the increase of learning result score of students taught with interactive method leads to the conclusion that the application of interactive learning model has a significant effect on the value of laboratory skills in Pregnancy Midwifery Course.

4. CONCLUSION

Learners with conventional learning are those that only listen to explanations from educators. Conventional learning models do not provide ample opportunities for learners to participate actively and do not trigger their curiosity. This learning model causes learners to be bored easily with the less pleasant atmosphere. The absence of an active role of learners in learning activities make learners only get information from the utilization of the sense of hearing alone, so that the information obtained will not be optimum.

Selection of learning methods will determine the results achieved. Selection of appropriate learning methods will increase test scores in terms of cognitive, affective, and psychomotor. Video learning will make it easier for students to learn. Seeing real practice through video will help students understand more easily. A good understanding will increase laboratory skills, where students can practice after seeing the real practice in clinics or hospitals.

The learning model using interactive learning media is a strategy that can be provided by educators by minimizing the amount of direct instruction in their teaching practice while maximizing interaction with each other. This strategy utilizes technology that provides additional supporting learning materials for students which is accessible online. This frees up the class time that has previously been used for learning.

ACKNOWLEDGEMENTS

Implementation of learning methods using interactive learning media improves the laboratory skills of DIII Midwifery students in pregnancy care subject. The implementation of learning methods using interactive learning media requires careful preparation, so that the material can be delivered before the learning process begins.

REFERENCES

Abeysekera and Dawson. 2015.*Motivation and cognitive load in the flipped classroom: definition, rationale and a call for research*. Higher Education Research & Development.

Ades, Sanjaya. 2011. *Model-model Pembelajaran*. Jakarta: Bumi Aksara.

Dimyati dan Mujiono. 2002. *Psikologi Pendidikan*. Jakarta: Rineka Cipta.

Fitriyana, Ulfa.2014. *Implemtasi Strategi Flipped Classroom dalam Pembelajaran Matematika Terhadap Kemampuan Kognitif Ditinjau dari Keaktifan Belajar Siswa SMA Negeri 1 Surakarta* . Surakarta.

Halili and Zainuddin. 2015.*Flipping The Classroom: What We Know And What We Don't. The Online Journal of Distance Education and e-Learning*. Volume 3, Issue 1.

Milman, Natalie. 2012*. The Flipped Classroom Strategy What is it and How Can it Best be Used?*. Jurnal Internasional Volume 9, Issue 3

Nana Sudjana. 2010 . *Dasar-dasar Proses Belajar Mengajar*. Bandung : Sinar Baru Algesindo.

Roehl, Amy, Shweta Linga dkk. 2013. *The Flipped Classroom: An Opportunity To Engage Millennial Students Through Active Learning Strategies.* Texas : Christian University Jurnal Internasional Vol. 105. No. 2. 2013 JFCS.

Sanjaya,Wina. 2012.*Srategi Pembelajaran Berorientasi Standar Proses Pendidikan*.Jakarta: Kencana Prenada Media Group

Shimamoto, Dean N. 2012. *Implementing a Flipped Classroom: An Instructional Module.* Hawai Amerika Serikat: Department of Educational Technology University of Hawaii Manoa.

Vera Septi Andrini, Punaji Setyosari, Siti Zubaidah and Saedah Ulfa. 2017. *The Effect of Flipped Classroom Model through Handout and Virtual Approaches on Learning Outcomes for the Students of Universitas Terbuka Who Have Different Level of Motivation and Learning*. Global Journal of Pure and Applied Mathematics. ISSN 0973-1768 Volume 13, Number 7, pp. 3145-3156. Research India Publications.

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A Phenomenological Analysis of Commercial Sex Workers in Preventing the Transmission of HIV/AIDS

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Keyword:

Prostitutes,
Transmission prevention,
HIV/AIDS

ABSTRACT

The transmission of HIV/AIDS in Indonesia is growing fast. One of the triggers is risky sexual behaviors done by prostitutes and their customers. This study is aimed at obtaining in-depth understanding of the efforts made by prostitutes in preventing the contagious disease of HIV/AIDS in Semarang city. The method used in this study was qualitative design with phenomenology approach. There were 8 participants involved and were selected by using purposive sampling technique. The data were collected by using in-depth interview technique with semi-structured questions, while the data analysis was carried out based on Colaizzi steps. The results of the study are divided into 3 themes: obtaining information from health professionals, optimizing the available health facilities, and the consistency of condom use. The study concludes that the participants are able to recognize the risk of disease threatening their health so that they obey the advice given by health professionals to diligently do health screening and try to use condom when serving the guests. The study suggests that it is important to strengthen the commitment of the prostitutes to obey the advice given by health professionals

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1. INTRODUCTION

AIDS (Acquired Immunodeficiency Syndrome) is a syndrome with symptoms of opportunistic illness or certain cancers resulting from a decline in the immune system infected by HIV (human immunodeficiency virus) (Duarsa, 2007). HIV/ AIDS is a threat of sickness and death in various countries, including in Indonesia. Transmission of HIV/ AIDS in Indonesia is growing fast. One of the reasons is due to risky sexual behavior (Tully, Cojocaru, Bauch, 2015; Kristianti 2012). This risky sexual behavior is usually done by prostitutes. The customers of the prostitutes who do not care about safe sexual practices by using condoms are potentially infected with HIV / AIDS from their partners. As a result, their wives, who do not know about the husband's risky sexual behavior, are at high risk of HIV infection (Kristanti, 2012).

2. RESEARCH METHOD

The research used qualitative method with phenomenology approach. (Pollit, Beck & Hungler, 2001). The researcher attempted to analyze the prostitutes' sexual behavior in the prevention of

sexually transmitted diseases HIV/ AIDS in Semarang city. The population in this research was the female prostitutes in Gambilangu, located in Semarang city,especially in the working area of society health center in Mangkang. The sample was selected by using purposive sampling technique (Hardiyansyah,2010).

The criteria of the participants in this study include: the prostitutes who are localized in Gambilangu, Semarang city and have been practicing this activity for approximately 6 months, and are willing to be respondents by giving informed consent approval. The ideal number of participants in qualitative research with the phenomenological method is around 3-10 people (Dukes, 1984 in Cresswell, 1989). In this study, the number of the participants was 8 and there was data saturation.

This research was conducted in Gambilangu, Semarang city area, especially in the working area of society health center in Mangkang. The data were collected by using in-depth interview technique with using semi-structured questions. Interviews were also provided with field notes to identify non-verbal responses and situations during interviews (Cresswell, 2010).

3. RESULTS AND ANALYSIS

This chapter describes the results of research obtained on the prevention of sexually transmitted diseases HIV/ AIDS in Semarang city. The study covers three themes that include: (1) Obtaining information from health professionals, (2) Optimizing the use of available health facilities and, (3) Consistency of condom use. Several efforts have been made to prevent the transmission of sexually transmitted diseases either by the participants or health professionals and society health center. Participants received information and facilities from health professionals and society health center in the form of health education, provision of condoms, guidance, inspection, and periodical screening.

Obtaining information from health professionals

Participants in this study said that they knew how to prevent sexually transmitted diseases because they had already got information in the form of health education from the officers of society health center. Participants revealed that they joined routine activities held by the society health center twice in a week. From these activities, the participants admitted to gain knowledge about sexually transmitted diseases in terms of the types and ways to prevent them. Here are the participants' statements:

> *"... Yes, I usually get explanation in the building, on Monday and Wednesday in the counseling about HIV/AIDS disease. I got information about the type of person that can get this kind of diseases, just like syphilis, and Fluor albus. So, every Monday the leader likes to give counseling about that ... (P1)."*
>
> *".... there has already been a counseling. I often join the counseling, as well.. (P2)."*
>
> *"... every time I am here, there is such a counseling whether it is conducted twice in a week or an exercise on Wednesday and then....we are always told when there is a counseling....(P3)."*
>
> *"... good, because every Monday we must come because there is a counseling...(P5)."*
>
> *"....the disease counseling on sexually infected contagious disease, like gonorrhoea, condyloma acuminatum, I forget the rests, but there are many of them (P6), we also get guidance, screening, and we get to join a gymnastics. Sometimes we are appreciated by them, you know. We were once invited for gymnastics in the town hall... (P6)."*
>
> *".... Here we often participate in health activities, and counseling is recommended every two weeks. The screening should be done to know whether we are infected by the disease or not, the VCT blood taking is also periodically taken once every three months ... (P7)."*

Optimizing the use of available health facilities

All participants in this study reported that they received facilities in the forms of regular health check and screening from the society health center. This helps the participants in monitoring their health condition. The participants' statements can be seen below:

"....Thank god.....healthy, yesterday I had the VCT and the result willprobably come out this Monday, the screening is on Monday .... (P2)."

"..... the VCT is conducted once every three months. There is also screening there..... (P3)."

"... we also get counseling, as well as screening.There are gymnastics and counseling. Sometimes we are appreciated by them, you know. We were once invited for gymnastics in the town hall... (P6)."

"... here we should do screening, it is usually conducted on Wednesday. On Monday we do not get screening, the point is we support the program.... (P5)."

One participantwho had one child also reported that the health professionals provided explanations regarding the functions of screening and VCT. This is very beneficial for participants in an effort to prevent the emergence of sexually transmitted diseases. Here are their opinions:

"....The screening is carried out to prevent any diseases, so later you can see whether you are infected by diseases or not. I said 'yes' to her, if you work here, you must obey the rules. When the time comes for screening, we do the screening. When the time comes for having injection, we will have it. Regarding VCT, I asked what VCT was. VCT is used to take blood sample in order to find out whether I have diseases or not, and it lasts up to now...(P4)."

"...here we often join healthy activities, the counseling is suggested to be done twice in a week together with screening to find out whether we have diseases or not. The VCT blood sample taking is also periodically taken once every three months ... (P7)."

The monitoring of health outcomes and screening was documented in a book. Each participant had a health record book. One participant described the experiences as follows:

"... yes we have a book for the screening, and later it will be checked in the laboratory. If there is a disease, for example like having infected contagious disease, it will be written in the book report. If there is not any disease, then the book will be ticked.. (P8)."

Consistency of condom use

Another important effort which had been made in the prevention of sexually transmitted diseases was the consistency or commitment of the participants in using condoms while they worked. This study showed some results in which there were those who were obedient and less obedient.Some of them needed to persuade their guests to be willing to use condoms and provided explanations about the benefits of it for the guests. The followings are the explanation in details. There have already been some participants who consistently used condoms while serving the guests and dared to refuse their guests if they did not want to use a condom. We can see the participants' statements below:

"... if there is any guest who disagrees to use a condom, then I will just decline him... (P3)."

"...I keep on using condoms until now ... (P5)."

One of the efforts made by participants in the prevention of sexually transmitted diseases is by persuading guests to use condoms. Here are their statements:

> *".... yes so I tried to persuade him by saying I would give him "the service" if he was willing to use a condom... (P2)."*

> *"... I will say I like using condoms, 'if you are not willingto use it, you will get infected by diseases, we have to keep ourselves safe, including you as a customer, and me too' and then he would finally agree. So,I think if I persuade him nicely, he will be willing to do that... (P3)."*

> *".... at the moment, they keep wearing it, yeah, just persuade them ... (P5)."*

These participants claimed to persuade the customers to be willing to use condoms to prevent the risk of the disease transmission to the customer's family and for the sake of safety so that participants would not be pregnant. Here are what they said:

> *"...to prevent the disease, persuading the customers to use condoms is necessary because you have a family and I also have a family... (P4)."*

> *"...we should be able to persuade him so that he wants to use condom. In my case, I said to him like this 'Sir, I am fertile. Meanwhile, I have got a lot of children. I don't have anyone else except my children, don't you feel pity?', we must be able to persuade him and ask them what will happen if I am pregnant... (P7)."*

Some explanations were shown by the participants both verbally and by showing a book or leaflet which they have got about sexually transmitted diseases, their impact and the prevention done by persuading their customers to use condoms. The following is the a participant's statements:

> *"...we have to know how to make him want to wear condoms. One costumer said,'I did not want to use it, miss. So, how is it,miss?' So, theyactually depend on us, I tried to keep persuading him. The point is that I have to explain to him by showing the book to the customers about the diseases. If you insist on not using condoms, then I have to explain the consequences if we get these diseases. For males, it will like so and for females, it will be like so. I will ask him to just read first, and then I will just show him... (P1)."*

Discussion

Preventive efforts from contagious diseases from the participants were done through various ways, such as getting information from health professionals, and others. The information from health professionals was given in the form of health education on sexually transmitted diseases and the preventive efforts. The health information has proved to increase the knowledge and understanding of the participants about health. According to Zimmerman and Woolf (2014), health education can increase one's knowledge about science. It was also experienced by the respondents, where with the provision of health education provided for the respondents, they could understand sexually transmitted diseases and the impacts they had for their health.

Information on health resulted in the increased knowledge about health and preventive behavior for sexually transmitted diseases carried out by the respondents. According to research conducted by Xinying Sun (2014), knowledge about health is proportional to health behavior and health status.

It was proven during research that when having transactions with the guests, the respondents made agreements on the condom use. A study conducted by Teiljlingen & Bhatta in 2010 shows that knowledge about health affects the use of condoms in prostitutes.

The results of the study show that the knowledge implanted by health professionals was imprinted and recorded on the respondents' mind. It could be identified from the efforts made by respondents who kept their commitment to use condoms. They even frequently persuaded and provided explanations to their guests. The prostitutes commonly have a high risk for being infected by sexually transmitted diseases. In this study, the respondents with high awareness used health care facilities provided by society health center for the diseases prevention. Society health center as the guard for the

prostitution localization in Gambilangu, Semarang provides health care facilities, such as infectious disease screening periodically.

Screening is an early detection effort to examine the occurrence of a disease (Speechley, Kunnilathu, Aluckal, Balakrishna, Mathew, George, 2017). Screening for sexually transmitted diseases can detect the presence of sexually transmitted diseases in order to be early identified to facilitate treatment and prevent the spread of the disease extensively (Committee on Adolescence and Society for Adolescents Health Medicine, 2014).

4. CONCLUSION

It can be concluded from this study that the participants were able to recognize the risk of disease threatening their health so that they obeyed the advice given by the health professionals to diligently do health screening and to use condom when serving the guests. The suggestion obtained from this study is that it is essential for prostitutes to be committed and to obey the advice given by health professionals.

REFERENCES

Cresswell, J.W.(2010) Research design: Pendekatan kualitatif, kuantitatif dan mixed. Penerjemah Achmad Fawaid. Penerbit Pustaka pelajar, Jogyakarta.

Cresswell, J.W.(1989). Qualitatif inquiry and Research design; Choosing among five tradition. Sage Publication. California.

Committe on Adolescence and Society for Adollesent Health Medicine.(2014). Screening for Nonviral Sexually Transmitted Infections in Adolescents and Young Adults. Pediatrics. July 2014, VOLUME 134 / ISSUE 1

Duarsa, N. W. (2007). Infeksi dan HIV/AIDS dalam Buku Infeksi Menular Seksual.. FKUI: Jakarta.

Herdiansyah, H. (2010). Metode penelitian kualitatif untuk ilmu-ilmu sosial. Yogyakarta. Greentea Publishing.

Kristianti Shinta. (2012). Support of prostitutes and their customers towards the use of Condoms Behavior Among Female Sex Worker's Clients In Semampir Of Kediri. Poltekkes Kemenkes Malang Program StudiKebidanan Kediri. ABSTRAK Jurnal STIKES Volume 5, No. 2, Desember 2012

Pollit,P.F & Beck,C.T & Hungler,B.P.(2001). Essential of nursing research: Methods appraisal and utilization. St.Louis: Mosby,Inc.

Speechley, Kunnilathu, Aluckal, Balakrishna, Mathew, George. (2017). Screening in Public Health and Clinical Care: Similarities and Differences in Definitions, Types, and Aims – A Systematic Review. Community Medicine Section DOI : 10.7860/JCDR/2017/24811.9419. Year : 2017 | Month : Mar | Volume : 11 | Issue : 03

Teijlingen, Bhatta. (2010). Sexual health knowledge, sexual relationships and condom use among male trekking guides in Nepal: a qualitative study. An International Journal for Research, Intervention and Care. Volume 12, 2010 - Issue 1

Tully, Cojocaru, Bauch. (2015). Sexual behavior, risk perception, and HIV transmission can respond to HIV antiviral drugs and vaccines through multiple pathways. Scientific Reports5, Article number: 15411 (2015). doi:10.1038/srep15411

Xinying Sun (2014). Relationships of Health Literacy, Health Behavior, and Health Status Regarding Infectious Respiratory Diseases: Application of a Skill-Based Measure. Journal of Health Communication. International Perspectives. Volume 19, 2014- Issue sup2: Highliting Progres in the Field of Health Literacy Research.

Zimmerman dan Woolf (2014), Understanding the Relationship Beetwen Education and Health. Institute of Medicine of The National Academies. Advising the Nation. Improving health. https://nam.edu/wp-content/uploads/2015/06/BPH-UnderstandingTheRelationship1.pdf.

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Emotion Regulation and Health-Related Quality of Life Among College Students with Asthma

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Article Info

Keyword:

Health-Related Quality of Life, Emotion Regulation,
College Students with Asthma

ABSTRACT

The purpose of this study was to determine the relationship between emotion regulation and health-related quality of life among college students with asthma. This study involved college students with aged 18 – 25 years old. There were two hypotheses, there was a significant relationship between cognitive-reappraisal and health-related quality of life among college students with asthma and there was a significant relationship between expressive suppression and health-related quality of life among college students with asthma. The measurement of this study used the modified Health-Related Quality of Life scale from Asthma Quality of Life Questionnaire (AQLQ) by Juniper and used the modified Emotion Regulation scale from Emotion Regulation Questionnaire (ERQ) by Gross. The result of the analysis showed that the first hypothesis with p = 0.015 (p <0.05) r = 0.0383, and the second hypothesis were rejected with p = 0.780 (p> 0.05) r = 0,046.

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1. INTRODUCTION

The prevalence of asthma has increased in Indonesia. Based on Basic Health Research about the prevalence of asthma's symptoms in Indonesia, the highest position is held by Central Sulawesi (7.80%) and the lowest position is held by Lampung (1.6%) [1]. Based on sex, the number of women with asthma is slightly higher (4.60%) than men (4.40%) [1]. Based on age, the most prevalent ones are those at the age of 25 to 34 years old (57%), followed by those aged 15 to 24 years old(56%) and 35 to 44 years old(56%) [1]. In addition, there is not any difference between the prevalence of asthma in the city (4.50%) or in the village (4.50%) (Kementerian Kesehatan RI, 2013).

Asthma is a chronic inflammatory disease with the presence of acute airway obstruction, airway inflammation, and an increase of mucus. An asthma sufferer can be diagnozed through some episodic symptoms, such as cough, wheezing, and breathing respiration (Clark, 2011). Asthma is caused by two factors, namely genetics and triggers (Brannon, 2010). A research by Usman, Chundrayetti, & Khairsyaf related to genetic factors, shows that there is a history of allergies or asthma from Asthma sufferer's family (Usman, 2010). Meanwhile, trigger factors are things that lead to asthma disease. Some trigger factors of asthma include fungi, pollen, dust, cockroaches, animal fur, respiratory infections, tobacco smoke, chemical sprays, abstract environments, strenuous exercise, and stress (Brannon, 2010).

WHO explains that asthma disease cannot be cured, but its development can be controlled (Katerine, 2014).Asthma is a disease that will continue to stay in the body, so it is possible that its recurrence can happen at anytime (Plottel, 2005). Some of the impacts include limited activity, awakening of respiratory disorders, and sudden attack (Clark, 2011). In general, the impacts of asthma can be felt by anyone, either children, adolescents, or adults (Plottel, 2005).Those who aremore susceptible to the effects of asthma are adults. Adulthood determines rise and fall of a person's physical performance (Santrock, 2012). An asthma sufferer who is not able to cultivate his physical performance well tends to experience the recurrence of asthma. Based on this issue, the authors chose college students as the research subjects to represent adults with asthma.

In terms of human development phase, college students are in early adulthood with an age of 18 to 25 years old(Santrock, 2012). In early adulthood, college students will do a lot of experiments and explorations (Santrock, 2012). Moreover, college students also begin to face more complex issues in their lives. The specific issues are usually related to personal, family, academic, and peer relationship (Santrock, 2012). One of the problems that must be faced by college students with asthma is living with the illness they suffer. College students with asthma should consider the risks that they will experience before doing any activity. Plottel explains that college students with asthma should consider various activities to be done in order to minimize the recurrence of the disease (Plottel, 2005).

The authors conducted an interview on October 10th, 2016 on three college students to determine the impacts of asthma in their lives. Three college students are asthma surferrer who have been diagnosed since childhood and have genetic factors. Based on the results of interview, it can be concluded that each college students had different experiences. In addition, the three college students also had different expectations for themselves against asthma. A person's expectations might be different from each other depending on the predecessor events (Carr, 2003).Furthermore, something important that formed their expectations and ambitions could determine their quality of life (Carr, 2003). If someone is unable to control their psychological function properly, they may have a poor quality of life. Rise and fall of quality of life will measure the extent to which individual expectations are achieved(Carr, 2003).Based on the information obtained from the three college students, the authors chose quality of life (QoL) as a variable to be studied in relation to experiences and expectations.

Quality of life (QoL) is an individual's perception of his/ her position within the cultural system and the values in which they settle in relation to goals, expectations, standards and worries in life (WHO, 1997).The term of quality of life (QoL) is in separable from its relation to health status. The connection between quality of life (QoL) and health begins when WHO defines health and expresses the importance of the following three dimensions: physical, mental, and social. Bowling explains that quality of life (QoL) and health is based on "pathology" and focuses on measuring physical and mental decline, impaired role and social function (Carr, 2003). Furthermore, the connection between quality of life (QoL) and health is referred to as quality of life (QoL) related to health or health-related quality of life(HRQoL) (Fayers, 2007).

Health-related quality of life (HRQoL) is referred to a person's role in viewing health perception, life satisfaction, health status, and future life (Phillips, 2006).In asthma sufferer, quality of life (QoL) is called by health-related quality of life (HRQoL) with asthma (Juniper, 1993). Generally, there are several factors that influence health-related quality of life (HRQoL). The factors, such as socio demographic factors, psychological factors, clinical factors, and factors related to treatment(Have, 2014).Author focuses on psychological factors as one of the factors that mostly affect health-related quality of life (HRQoL) in college students with asthma. Psychological factors involve individual psychic states, includinganxiety(Have, 2014). Lazarus explains that anxiety is one of the stress emotion (Wang, 2011). Individual's ability to deal with anxiety depends on his/ her maturity, such as the individual's ability to control him/ herself, his/ her behavior and emotional arrangement (Aprisandityas, 2012). One of maturity characteristics that is needed by college students with asthma is a good emotional arrangement. Thus, a good emotional arrangement is needed to deal with emotional reactions [15]. Based on the description above, the authors chose a good emotional arrangement as a part of psychological factors which may affect health-related quality of life of college students with asthma. A person's ability to manage good emotions is further referred to as emotion regulation (ER) (Kalat, 2007).

Theoretically, emotion regulation (ER) is a strategy used to control excessive emotion and how strongly a person faces that emotion (Kalat, 2007). Brannon and Feist explain that one of the trigger factors of asthma symptoms is emotion reaction, such as stress and fear (Brannon, 2010). The emotion reaction (ER) can lead to depression, anger, sadness, and so on. The American University Health Association shows that college students are vulnerable to mental fatigue, sadness, depression, hopelessness, and overwhelming feeling caused by the demands that to be done(Santrock, 2012). These conditions that may affect college students' emotions can trigger the ocurrence of respiratory problems, or worse, asthma attacks. College students with asthma require proper emotional regulation (ER) ability in facing the conditions thatpressurize them in life to minimize the recurrence of asthma.

Based on the description, the purpose of this research is to determinethe relationship between emotion regulation (ER) and health-related quality of life (HRQoL) among college students with asthma. Emotion regulation (ER) consists of two strategies, which ARE cognitive reappraisal (CR) dan expressive suppression (ES) (Gross, 2003). Cognitive reappraisal (CR)is a process of situation decomposition, so that it can change the emotion response before being expressed. Meanwhile, expressive suppression (ES) is a process of emotion modulation to obstruct emotion expression behavior (especially negative behavior) (Mayangsari, 2014). College students with asthma can regulate their emotion with cognitive reappraisal (CR) or expressive suppression (ES). Based on these strategies, there are two hypotheses of this research. The hypotheses are: 1)there is a significant relationship between cognitive reappraisal (CR) and health-related quality of life (HRQoL) among college students with asthma, and 2) there is a significant relationship between expressive suppression (ES) and health-related quality of life (HRQoL) among college students with asthma.

2. RESEARCH METHOD

Research Design

A correlational study is used as quantitative method to determine relationship between emotion regulation (ER) and health-related quality of life (HRQoL). In this research, health-related quality of life (HRQoL) is the dependent variable and emotion regulation (ER) is the independent variable.

Research Respondent

This researchused snowball sampling technique to obtain several respondents. Criteria for this researchareundergraduate students aged 18-25 years old who are diagnozed with asthma. As the result, there were 40 respondents who participated in this study who were from several faculties at X University, Yogyakarta.

Data Collection

The authors used a questionnaire to collect data from respondents. There were two measurement instrument, namely health-related quality of life (HRQoL) scale and emotion regulation(ER) scale. The health-related quality of life (HRQoL) scale was adapted from Asthma Quality of Life Questionnaire (AQLQ) scale by Juniper (1993). There were 32 favorable items which had been translated into Indonesian by Yuniarti BoKwartarini. 'Bo' is a senior translator and lecturer at Gadjah Mada University. She is also an expert in health and clinical cross-cultural psychology. The health-related quality of life (HRQoL) scale measured four domains, including activity limitation (11 items), symptoms (12 items), emotional function (five items), and environment stimuli (four items) (Juniper, 1993). There were seven choices of answers for each of the 32 items (1 indicates maximum impairment and 7 indicates no impairment).

Table 1.Distribution of Health-Related Quality of Life (HRQoL) Scale Items

Domain	***Favorable Items***	
	Item numbers	**Total**
Activity limitation	1, 2, 3, 4, 5, 11, 19, 25, 28, 31,32	11
Symptoms	6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 29, 30	12
Emotional factor	7, 13, 15, 21, 27	5
Environment influence	9, 17, 23, 26	4
		32

Meanwhile, the emotion regulation (ER) scale was adapted from Emotion Regulation Questionnaire (ERQ) scale by Gross (2003).Emotion Regulation (ER) scale had been translated into Indonesian with back translation technique. The back translation was done by translating the questionnaire into target language, translated the questionnaire back into the original language, and finally compared both versions to avoid bias translation (Beaton, 2000).There were 10 favorable items in this scale. Emotion regulation (ER) scale measured two strategies, i. e. cognitive reappraisal (CR) and expressive suppression (ES). There were seven choices of answers for each of the 10 items.

Tabel 2. Distribution of Emotion Regulation (ER) Scale Items

Regulation Strategies	*Favorable Items*	
	Item numbers	**Total**
Cognitive Reappraisal	1, 3, 5, 7, 8, 10	6
Expression Suppression	2, 4, 6, 9	4
10		

Data Analysis

Statistical analysis wasused to determine the relationship between emotional regulation (ER) and health-related quality of life (HRQoL) in asthma sufferers (Azwar, 2014). This researchused correlation technique of Pearson's Product-Moment and Spearman's Rho with SPSS (Scientific Program and Social Science) version 23.0 for Windows.

3. RESULT AND ANALYSIS

Description of Research Participant

Table 3.Description by sex

Sex	N	Percentage (%)
Female	30	75%
Male	10	25%
Total	40	100%

Table 4.Description by age and period of suffer

Age	N	(%)	Period of Suffer	N	(%)
< 21 years old	15	37.5%	< 10 years	19	47.5%
≥ 21 years old	25	62.5%	≥ 10 years	21	52.5%
Total	40	100 %	**Total**	40	100%

Table 5.Description by place of origin

Place of origin	N	Percentage (%)
Java	26	65 %
Borneo	6	15 %
Sumatra	5	12.5%
Papua	2	5 %
Nusa Tenggara	1	2.5%
Total	**40**	**100 %**

Based on tables above, 40 respondents in this research consisted of 30 female respondents (75%) and 10 male respondents (25%). This data shows that the number of female respondents wasbigger than that of male respondents. There were 25 respondents(62.5%)aged more than 21 years old,and 21 respondents (52.5%) suffering from asthma for more than 10 years. This data shows that most (62.5%) of the respondents in this study were more than 21 years old and had suffered from asthma for more than 10 years (52.5%). In addition, 26 of 40 respondents were from Java (65%). This data shows that most of the respondents (65%) in this study were from Java.

Description of Research Data

Description of research data ofhealth-related quality of life (HRQoL) and emotion regulation (cognitive reappraisal & expressive suppression) is described in Table 6.

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Table 6.Description of research data

HRQoL		Category	Cognitive Reappraisal		Expressive Suppression	
N	(%)		N	(%)	N	(%)
7	17.5%	Very low	7	17.5%	7	17.5%
9	22.5%	Low	7	17.5%	7	17.5%
7	17.5%	Normal	9	22.5%	8	20.0%
9	22.5%	High	9	22.5%	10	25.0%
8	20.0%	Very high	8	20.0%	8	20.0%
40	**100%**		**40**	**100%**	**40**	**100%**

Based on Table 6, the percentages show that all respondents in this research had a health-related quality of life (HRQoL) with the same spread in each category. Furthermore, this data shows that all respondents performed emotion regulation (cognitive reappraisal & expressive suppression) with different intensity in each category.

Assumption Test

Normality Test

Normality test was conducted to determine whether the data distribution in this study was normal or abnormal. The data spread is said to be normal when p> 0.05, whereas it is said to be abnormal when p < 0.05. The normality testwas done by one-sample technique Kolmogrov-Smirnov.

Table 7.Normality test result of Health-related quality of life

Variable	K-SZ	p	Note
Health-related quality of life	0.126	0.108	Normal

Note : K-SZ : significance index*Kolmogrov-Smirnov Z*
p : significance

Tabel 8.Normality test result of emotion regulation

Variable	K-SZ	p	Note
Cognitive Reappraisal	0.113	0.200	Normal
Expressive Suppression	0.111	0.200	Normal

Note : K-SZ : significance index *Kolmogrov-Smirnov Z*
p : significance

The result of health-related quality of life (HRQoL) normality test shows K-SZ = 0.126 with p = 0.108 (p > 0.05). The cognitive reappraisal (CR) strategy shows the score of K-SZ = 0.113 with p = 0.200 (p > 0.05), and the score of expressive suppression (ES) strategy K-SZ = 0.111 with p = 0200 (p > 0.05). The results of this normality test indicate that health-related quality of life (HRQoL) variables, cognitive reappraisal (CR) strategy, and expressive suppression (ES) strategy were normally distributed.

Linearity test

Linearity test was used to find out whether there is a linear relationship between health-related quality of life (HRQoL) variable and emotional regulation (ER) variable. Both variables are said to be linear if p<0.05 and not linear if p> 0.05.

Table 9.Linearity test result

Variable	F	Sig.	Note
Health-related quality of life with cognitive reappraisal	5,274	0.032	Linear
Health-related quality of life with expressive suppression	0.000	0.990	Not Linear

The result of linearity test shows that the health-related quality of life (HRQoL) and cognitive reappraisal (CR) strategy had a linear relationship with p = 0.032 (p < 0.05), while the health-related quality of life (HRQoL) and expression suppression (ES) variables did not havea linear relationship with p = 0.999 (p > 0.05).

Hypothesis test

Hypothesis test was conducted to measure correlation between health-related quality of life (HRQoL) and emotional regulation (ER). The hypothesis is accepted when the significance value of p < 0.05 and rejected if p > 0.05.

Table 10.Hypothesis test result

Emotion Regulation	R	p	Note
Cognitive Reappraisal	0.383	0.015	Accepted
Expressive Suppression	-0.046	0.780	Rejected

Note : r : Correlation index of HRQoL with emotion regulation strategies
p : Significance

Based on normality and linearity test, the first hypothesis was tested with Pearson Product Moment technique because the data was normal and had linear distribution, while the second hypothesis was tested with Spearman's Rho technique because it had normal distribution but was not linear. The result of correlation analysis between health-related quality of life and cognitive reappraisal showed that p = 0.015 (p <0.05) with Pearson correlation value of r = 0.383. Furthermore, the correlation between health-related quality of life and expressive suppression shows that p = 0.780 (p> 0.05) with Spearman's Rho correlation value of r = -0.046. The results of these hypotheses test showed that cognitive reappraisal (CR) had a significant relationship with health-related quality of life (HRQoL), whereas expressive suppression (ES) was not related to health-related quality of life (HRQoL).

Discussion

The research that determines emotional regulation (ER) and health-related quality of life (HRQoL) in college students with asthma was conducted on 40 respondents at X University, Yogyakarta. Based on the analysis, there were 30 female respondents (75%) and 10 male respondents (25%). Based on age, there were 25 respondents (62.5%) agedmore than 21 years old and 15 respondents (37.5%) aged less than 21 years old. In addition, the number of respondents who suffered from asthma for less than 10 years was 19 respondents (47.5%) and the number of those who suffered from asthma for more than 10 years was 21 respondents (52.5%). Based on the analysis, asthma can develop at any age. Asthma is the most common chronic desease inchildren. However, it also affects adults. Although some people have asthma as a child, othersdo not experience it until they are an adult (Plottel, 2005).

This research used two types of scale, health-related quality of life (HRQoL) scale and emotional regulation (ER) scale. The health-related quality of life (HRQoL) scale was adapted from the Asthma Quality of Life Questionnaire (AQLQ) by Juniper (1993).Based on the validity and reliability test done, health-related quality of life (HRQoL) scale moved from 0.374 to 0.804 with a reliability coefficient of 0.959. Meanwhile, the emotional regulation (ER) scale was adapted from the Emotion Regulation Questionnaire (ERQ) by Gross (2003).Based on the validity and reliability test, the scale of emotional regulation moved from 0.408 to 0.749 with a reliability coefficient of 0.874. The results of the validity and reliability test showed that the scale of health-related quality of life (HRQoL) and emotional regulation (ER) werevalid and reliable.

Health-related quality of life (HRQoL) can be achieved when an asthma sufferer is able to regulate emotion reaction toa problem encountered. This research consisted of two hypotheses that referred to two emotion regulation strategies, namely cognitive reappraisal (CR) and expressive suppression (ES). Cognitive reappraisal (CR) strategy emphasize individual assessment of situations and affects him/ her in expressing emotions (positive and negative) to others, whereas expressive suppression (ES) strategy is associated with suppression of emotionalexpression and avoidance of interactions that involve emotionalexpression (Gross, 2003). Based on data analysis that was done,

cognitive reappraisal (CR) strategy was significantly correlated with health-related quality of life (r = 0.383; p = 0.015).

A significant correlation between cognitive reappraisal (CR) strategy and health-related quality of life (HRQoL) indicates that the ability of asthma sufferers to evaluate their mind was related to the high level of health-related quality of life (HRQoL). Gross and John explain that reappraisal is positively related to mood because individuals will try to think differently about the situation [17]. Other research by Ciuluvicaa, Ameriob, Fulcheria on emotional regulation (ER) and quality of life (QoL) in dermatologic patients also showsed that reappraisal strategy could improve the well-being of patients with the presence of positive emotions in everyday life (Ciuluvica, 2014).In addition, the experimental research by Mustafa, Nashori, and Astuti described the connection between emotional regulation with the improvement of quality of life in patients with hypertension (Mustafa, 2016).The experimental results showed that the patients who were given cognitive reappraisal (CR) training, hadan increased quality of life (QoL) score after two weeks with home practice. Moreover, patients with hypertension hada more controlled blood pressure after blood pressure test.

Individuals who do cognitive reappraisal (CR) strategies can express their feelings to others as an effort to regulate emotional experience, while individuals who are unable to do cognitive reappraisal (CR) will choose a strategy of expression suppression (ES) to suppress their emotional experience (Gross, 2003).Based on the data analysis, expressive suppression (ES) strategy in this research was not correlated to health-related quality of life (r = -0.046; p = 0.780). The absence of correlation between expressive suppression (ES) strategy and health-related quality of life (HRQoL) indicates that the ability of asthma sufferers to suppress emotion expression was not related to the level of health-related quality of life (HRQoL).

The results of these analyzes are supported byresearch on expressive suppression. Individuals who often use expressive suppression (ES) strategy tend to avoid interaction and sharing experiences (emotional expression) with others (Gross, 2003).Individuals who often do expressive suppression (ES) strategy tend to be pessimistic about the future, have low self-esteem, have no self-satisfaction and relationships, and are susceptible to symptoms of depression (Gross, 2003).

However, the results of this analysis are different from those of the research conducted by Ciuluvica*et al*. that show a negative correlation between expressive suppression (ES) and quality of life (QoL) with p <0.01 and coefficient of -0.64 (Ciuluvica, 2014). In addition, the results of this analysis are also different from the researchresults by Ardebil, Bouzari, Shenas, Zeinalzadeh and West about depression and quality of life (QoL) in women with breast cancer (Ardebil, 2011).The results of the research shows a negative correlation between depression and quality of life (QoL) with a significance of 0.001 (p <0.05) and negative coefficient. Although expressive suppression (ES) strategies are different from depression variables, performing expressive suppression strategies will lead to depression.

Differences in the number of respondents in two previous studies are assumed to affect the difference of research results. Research by Ciuluvica et al. used 68 respondents (41 patients with dermatological disease and 27 healthy respondents) (Ciuluvica, 2014), while Ardebil et al. study used 60 respondents with breast cancer (Ardebil, 2011). In addition, there are several things that could be the cause of the rejection of the second hypothesis. First, cultural differences can influence the difference of the result. This research wasconducted on 40 respondents who were from various islands in Indonesia. Based on Table 5, the largest number of respondents were from Java with 26 respondents (65%). Based on research by Suciati & Agung, Javanese people are less expressive in showing emotion [24]. Javanese people tend to control the language or communication that they want to express because of the strong respect for others, tolerance to others and avoidance of things that can offend other people (Suciati, 2016).Second, the research method used might influence the research results. Prior research by Mustafa *et al.* used experimental research methods to determine whether emotion regulation training had an effect on improving quality of life in hypertensive patients(Mustafa, 2016). This research used correlational research method, so that researcher could not know the causes and effects in this research.

Based on the description above, there are some weaknesses in this research. First, the limitations of literature and journals that specifically discuss about health-related quality of life (HRQoL) in people with asthma. The limitation made it difficultto find a literature review in accordance with health-related quality of life (HRQoL) in people with asthma. Second, the limited number of respondents encountered in the field. Azwar explaines that more than 60 respodents were considered a big number, but methodologically the number of samples should refer to the heterogeneity of the

population. If it refers to Azwar's idea, the number of samples in the study (try-out and data collection) had not met the requirednumber. The limited number of respondents caused the scattering of scores less variable.

4. CONCLUSION

In conclusion, there was a significant relationship between cognitive reappraisal (CR) with health-related quality of life (HRQoL) in students with asthma. Thus, the health-related quality of life (HRQoL) of college students was significantly correlated with how frequent or infrequent college students performedcognitive reappraisal (CR) strategyagaints healthy problems. However, there was not any relationship between expressive suppression (ES) strategy and health-related quality of life (HRQoL) in college students with asthma. Thus, the health-related quality of life (HRQoL) owned by college students with asthma was not related to how frequent or infrequentcollege students performed expressive suppression (ES) strategyagainsthealthy problems.

Based on the results and discussion above, there are some suggestions for further research. Researchers who want to do research on the same topicare expected to increase the number of literature and journals used as the basis of the research, especially on the topic of health-related quality of life (HRQoL) in asthma. There is also a needto reproduce the respondents, both during trial and during data retrieval, so the spread of the score becomes more varied. If the researchers want to change the subject of research, they are expected to use health-related quality of life (HRQoL) measuring tools specially prepared for the subjects or the intended disease.

REFERENCES

Aprisandityas, 2012) A.; Elfida, D.; , "Hubungan antara regulasi emosi dengan kecemasan pada ibu hamil," *Jurnal Psikologi*, vol.8, no.2, pp.80-89, 2012.

Ardebil,M.D.; Bouzari, Z.; Shenas, M.H.; Zeinalzadeh, M.; Barat, S.; , "Deppression and health related quality of life in breast cancer patients," *Academic Journal of Cancer Research*, vol.4, no.2, pp.43-46, 2011.

Azwar, S.; , "*Penyusunan Skala Psikologi Edisi 2,"* Yogyakarta: Pustaka Pelajar, 2014.

Beaton,D.E.; Bombardier, C.; Guillemin, F.; Ferraz, M.B.; , "Guidelines for the process of cross-cultural adaptation of self-report measures," *Spine,* vol.25, no.24, pp.3186-3191, 2000.

Brannon, L. & Feist, J.; , "*Health Psychology : An Introduction to Behavior and Health,".* United State of America : Wadsworth Cengage Learning, 2010.

Carr, A.J.; Higginson, I.J.; Robinson, P.G.; , "*Quality of Life*," London : BMJ Books, 2003.

Ciuluvica, C.; Amerio, P.; Fulcheri, M.; , "Emotion regulation strategies and quality of life in dermatologic patients," *Social and Behavioral Sciences,* no.127, pp.661-665, 2014.

Clark, M.V.; ,"*Asthma : The Clinician's Guide*," United Kingdom : Jones & Bartlett Learning, 2011.

Fayers, P.M; Machin, D.; , "Quality of Life : *The Assessment, analysis, and Interpretation of Patients Reported Outcomes (Second Edition),"* England : Wiley, 2007.

Gross, 2003. J.J.; John, O.P.; , "Individual differences in two emotion regulation processes : Implications for Affect, Relationships, and Well-Being," *Journal of Personality and Social Psychology*, vol.85, no.2, pp.348-362, 2003.

Have, M.; Aalst, K.; Kaptein, A.; Leenders, M.; Siersema, P.D.; Oldenburg, B.; Fidder, H.; , "Determinants of health-related quality of life in crohn's disease: A systematic review and meta-analysis," *Journal of Crohn's and Colitis,* vol.8, pp. 93-106, 2014.

Juniper, E.F.; Guyatt, G.H.; Penelope, J.F.; Griffith, L.E.; , "Measuring quality of life in asthma," *American Review of Respiratory Disease,* no.147, pp.832-838, 1993.

Kalat, J.W.; Shiota, M.N.; , "*Emotion*," Belmont, CA : Thomson Wadsworth, 2007.

Katerine; Medison, I; Rustam, E.; , "Hubungan tingkat pengetahuan mengenai asma dengan tingkat kontrol asma,"*Jurnal Kesehatan Andalas*, vol.3, no.1, pp 58-62, 2014.

Kementrian Kesehatan RI; , "Riset Kesehatan Dasar," Jakarta : Bakti Husada, 2013.

Mayangsari,E.D.; Ranakusuma O.I.; , "Hubungan regulasi emosi dan kecemasan pada petugas penyidik POLRI dan penyidik PNS," *Jurnal Psikogenesis,* vol.3, no.1, pp.13-27, 2014.

Mustafa,K.; Nashori, F.; Astuti, Y. D.; ,"The emotion regulation training to improve quality of life in patients with hypertension," *Jurnal Kedokteran dan Kesehatan Indonesia*, vol.7, no.4, pp.143-150, 2016.

Phillips, D.; , "*Quality of Life : Concept, Policy and Practice*," London : 'Routledge', Taylor & Francis Group, 2006.

Plottel, S.C.; , "*100 Questions and Answers about Asthma*," Sudbury, MA : Jones and Bartlett Publishers, 2005.

Santrock, J.W.; , "*Life-Span Development,"*Jakarta : Penerbit Erlangga, 2012.

Suciati, R.; Agung, I.M.; , "Perbedaan ekspresi emosi pada orang Batak, Jawa, Melayu, dan Minangkabau," *Jurnal Psikologi,* vol.12, no.2, pp.99-108, 2016.

Usman; Chundrayetti; Khairsyaf; , "Faktor resiko dan faktor pencetus yang mempengaruhi kejadian asma pada anak di RSUP Dr. M. Djamil Padang," *Jurnal Kesehatan Andalas*, vol.4, no.2, pp 392-397, 2010.

Wang, M.; Saudino, K.J.; , "Emotion regulation and stress,"*Journal of Adult Development*, vol.18, pp.95-103, 2011.

World Health Organization; , "*WHOQOL-Measuring Quality of Life*," Switzerland : WHOQOL Group, 1997.

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The Effectiveness of Anemia Prevention Program in Different Age Groups in Developing Countries

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Article Info

Keyword:

Anemia,
Effectiveness
Food fortification,
Iron supplementation

ABSTRACT

Anemia is one of nutritional problems that has a high prevalence rate in developing countries. The deficiency decreases motor ability, cognitive ability, and mental ability in children. The impact of anemia to pregnant women can lead to poor delivery, premature infants, and low birth weight. The aim of this study was to analyze the effectiveness of Anemia Prevention Program in different age groups in various developing countries. This study is a literature review from recent journal articles. In India, iron supplement that was given to adolescent girls once a week has decreased the prevalence of anemia from 74.7% to 54.5%. Food fortification on wheat flour and milk can reduce anemia burden in children and women in Costa Rica. Iron supplement and food fortification on wheat flour in Nicaragua can reduce anemia prevalence from 23.7% to 11.2% and 33.5% to 16.2% in women and children aged 6-59 months, respectively. The MICAH (Micronutrients and Health) program conducted in Ghana for anemia that was supplemented by IFA can reduced 65% anemia in pregnant women and women of childbearing age. In Iran, daily taking of iron supplement was more effective than twice weekly in preventing Hb decrement in pregnant women. A study conducted in Tasikmalaya, Indonesia showed that prior the supplement intake, the average hemoglobin levels in all groups was 11.46 ± 1.19 g / dl and in all three groups increased sequentially 12.10 ± 1.08 g / dl, 12.03 ± 1.23 g / dl, and 11 , 79 ± 1.16 g / dl. Research on school-age children in Vietnam found that hemoglobin, serum ferritin has increased- reaching 42% - among group given fortified food and the prevalence of anemia decreased by 15.1%. Overall, the study showed that food fortification and iron supplementation have significant results in reducing anemia

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1. INTRODUCTION

Micronutrients deficiency is a global health problem.More than two billion people were estimated to have deficiency in vitamins and minerals, especially vitamin A, iodine, iron,and zinc.The most vulnerable groups suffering from micronutrient deficiencies are pregnant women, breastfeeding women, children, and women of childbearing age because they have a large need for vitamins and minerals and are more susceptible to the impact of the dangers of micronutrient deficiency(WHO, 2006).

Anaemia is one of nutritional problems with a high prevalence rate.According to the World Health Organization (WHO, 2005) there are up to 1.62 anaemia sufferers billion worldwide (24.8% of the global population)(Icazar, 2013). In Southeast Asia, the prevalence of pregnant women with anaemia is 48% (18 million), women of childbearing age is 46% (182 million) and 66% preschool children (115 million)(WHO, 2008).WHO estimates that anaemia causes deaths in Southeast Asia by 45%, Africa by 31%, Mediterranean East by 9%, America by 7%, Western Pacific by 7% and Europe by 3% and in low-income and medium countries by 97%(Mathers, 2009). The impact of anaemia on pregnant women can lead to

poor delivery, premature infants, low birth weight and complications of pregnancy and birth(Kavle, 2008). Anaemia is also associated with an increased risk of death and cognitive decline (Kassebaum, 2013). Anaemia has an impact on decreased motor ability, IQ score, cognitive ability, mental ability in children and decreased work productivity in adults (Assefa, 2014). Cognitive and work productivitydecrease can delay economic growth and lead to sustainable poverty and high health costs (Allen , 2000).

Baltussen et al. (2004) estimate the cost, effects, and cost-effectiveness of iron supplementation and iron fortification interventions in four regions of the world.In geographic coverage, 95% of iron supplementation has a greater impact on population health than iron fortification.In terms of cost, iron fortification is cheaper than iron supplementation and the impact is more effective than iron supplementation, regardless of geographic coverage (Baltussen, 2004).

2. RESEARCH METHOD

The method of this study was literature review from recent articles related to anaemia prevention programs in various ages in 7 countries recorded from 2002 to 2016 in developing countries, i.e India, Costa Rica, Nicaragua, Ghana, Iran, Indonesia, and Vietnam. The anaemia prevention programs of this study were food fortification and iron suplementation.

3. RESULTS AND ANALYSIS

Anaemia is an amount reduction of erythrocytes or hemoglobin (O_2 carrier) proteins from its normal level in the blood. Foods containing iron are foods derived from animal meat. The absorption of iron from animal meatis 20-30%. The habit of consuming foods that can interfere with iron absorption (such as coffee and tea) simultaneously at mealtime can lead to lower iron uptake (Arisman, 2007). Other factors that cause anaemia include poor feeding practices, less diverse food composition, physical growth, pregnancy and lactation, parasites, infections, chronic bleeding, low health care, the presence of absorbing inhibitors, and low socioeconomic conditions.Socioeconomic condition is related to education level, knowledge level, family size, occupation, and income (Al-Zabedi, 2014).

The policies and programs made by governments to reduce vitamin and mineral deficiencies are such as food diversification, fortification, supplementation, and nutrition education.Fortification and supplementation of iron is a frequent intervention to reduce the incidence of anaemia (Alavi, 2008). Food fortification is the addition of one or more micronutrients to the food consumed.This strategy can provide a relatively rapid improvement in the prevention of micronutrient deficiencies of a population, at a relatively cheaper rate compared to supplementation.However, the requirement offortified food is the staple food of the population, and not to change the color and taste of the food(Allen, 2006). Iron supplementation is one of the strategies for the prevention and treatment of anaemia and it can result in substantial improvements in the functional performance of individuals who are iron deficient and also in the population(Allen, 2002). Recent studies have demonstrated the benefits of iron supplementation in infants and children under the age of 5 years old, where iron supplementation can bring cognitive improvement and motor development in children with anaemia (Falkingham, 2010).

A research conducted by Le et al. (2006) in Vietnam in schoolchildren found that there was an increase in hemoglobin and serum ferritin in the fortified group of iron by 42% and the prevalence of anaemia decreased to 15.1%(Le, 2005). The iron fortification of staple foods is one of the ways to increase iron level in food products(Moretti, 2005). A study in India on the effects of candy fortification on children with anaemia showed an increase in hemoglobin by about 2 g / dL and 50% reduction in the prevalence of anaemia at baseline to 9.6% (Anand, 2007). Fortification of iron in wheat flour can reduce the prevalence of anaemia by nine points.Iron fortification reduces maternal perinatal mortality by one-third for cost per DALY calculation (supplementation is assumed to reduce mortality by two-thirds).The cost of iron fortification in wheat flour is about US $ 0.12 /person/year(Horton, 2006). The cost incurred for iron supplementation per woman is USD 0.76 per year(Horton, 2006).

The Adolescent Girls' Anaemia Control Pogramme in India aims to supplement Fe and folic acid once a week for adolescent girls. The process and output indicators used to assess the success of the program of conducting a medium-term impact analysis show that the prevalence of anaemia (Hb <12 g / L) decreased from 74.7% to 53.2%(Kotecha,2009). In Costa Rica, food fortification is one approach to overcome anaemia, but information on program effectiveness is limited.Interventions were performed in women aged 15-45 years and children aged 1-7 years. Fortification of food is done in wheat flour and milk.From the results of the intervention, it is found that anaemia is reduced in children and women.The

results were at the national level, anaemia decreased in children from 19.3% (95% CI: 16.8%, 21.8%) to 4.0% (95% CI: 2.1%, 5.9 %) and in women from 18.4% (95% CI: 15.8%, 20.9%) to 10.2% (95% CI: 8.2%, 12.2%)(Martorell, 2014).

Anaemia is a very important public health issue in Nicaragua since 1993, when the prevalence was 28.5% in children aged 1-4 years and 33.6% in women of childbearing age.As a part of the National Micronutrient Plan (NMP), the Integrated Anaemia Control Strategy (IACS), has been developed by the Ministry of Health and implemented since 2004.The programs from IACS are iron supplementation and IFA (iron / folat acid) for pregnant women and children <5 years old; fortification of wheat flour with iron and vitamin B; interventions to control vitamin A deficiency (supplementation and fortification of sugar); communication behavior change (BCC); comprehensive training of healthcare workers, public health volunteers (CHVs) and non-governmental organizations (NGOs), strengthening of other public health interventions; and monitoring and evaluation of program (M & E) systems.The results from IACS in 2000, a national micronutrient survey showed a dramatic decrease in vitamin A deficiency in children <5 years from 31.3% in 1993 to 8.8%.There was a significant decrease in the prevalence of anaemia in women of childbearing age from 33.6% to 23.7%.From 2000 to 2005,the prevalence of anaemia in women continued to decline from 33.6% to 11.2 % and in children aged 6-59 months from 33.5% to 16.2%(Mora, 2007).

The MICAH (Micronutrients and Health) program conducted in Ghana for anaemia is supplemented by IFA (iron / folad acid).The results show that there is a 65% reduction of pregnant women and women of childbearing age with anaemia(MacDonald, 2002).The mean of baseline Hb concentrations was 133 ± 11 g / L and 130 ± 12 g / L in the daily and supplemented group of 2 times per week. The mean of final Hb concentration was 127 ± 15 g / L in the daily group and 120 ± 13 g / L in the supplemented group of 2 times per week ($p < 0.05$).The decrease in Hb from the baseline to the end of therapy was significant in both groups and the decrease in Hb wasless significant in the daily group. Daily iron supplementation is more effective than the twice a week supplementation to prevent Hb reduction in pregnant women in Iran (Zamani, 2008).

Indonesian governmenttried to overcome the problem of anaemia in adolescents through supplementation of iron (60 mg FeSO4) and folic acid (0.25 mg).WHO has recommended consumption of iron tablets suplementationfor women of childbearing agewith intermittent menstruation (1 time / week), with iron suplementation dose of 60 mg elemental iron and 2.8 mg of folic acid for 12 weeks / 3 months. Ministry of Health has established that the ideal dose of iron supplementation in women of childbearing age is 1 tablet / week and during menstruation, it is given daily for 10 days in four months.The total tablets administered during supplementation is 52 tablets / year with theavailableiron suplementation the same as pregnant women. A study conducted in Tasikmalaya, Indonesia, showed that before supplementation was given, the average hemoglobin levels in all groups was 11.46 ± 1.19 g / dl. After supplementation, the mean of hemoglobin levels in the three groups sequentially increased; M, M + Mens, and M + PG groups were 12.10 ± 1.08 g / dl, 12.03 ± 1.23 g / dl, and 11.79 ± 1.16 g / dl.Iron supplementation in adolescents should be given intermittently (weekly) with the added benefit of high compliance of consumption (Susanti, 2016).

During pregnancy, the physiological need for iron increases. Therefore, pregnant women need to consume foods containing high iron. In addition, iron supplementation can help pregnant women in the fulfillment of iron in the body.Fortification targets are age groups that are prone to nutritional problems and who are in emergency situations that have insufficient nutritional intake through available food (e.g., fortification of complementary foods for children aged 6-24 months).Food fortification for children showed a significant improvement in serum concentrations of micronutrients, which can be used to see the effects at the population level. The meta-analysis study of micronutrient fortification in children showed an increase in hemoglobin concentration of 0.87 g / dL (95% CI 0.57-1.16) and lowered anaemia risk by 57% (RR) (0.43, 95% 0.26-0.71).The average increase in serum ferritin through fortification of 11.3 µg / L (95% CI 3.3-19.2) was compared with the control group. Fortification has great potential to improve the nutritional status of the population when a nutritional intervention strategy is implemented (Bhutta, 2013).

4. CONCLUSION

The prevalence of anaemia is a public health problem in various countries, as 20% of the world's population is known to have iron deficiency and 50% of individuals suffering from iron deficiency continue to suffer iron deficiency anaemia. According to the World Health Organization (WHO) report in 2008, the

prevalence of anaemia in pregnant women in 1993-2005 worldwide reached 41.8%.Anaemia prevention programs that have been conducted in various developed and developing countries such as food fortification, iron supplementation, education, as well as monitoring and evaluation of each program have worked well to decrease the prevalence of anaemia.The government is still expected to remain involve in anaemic countermeasures and also cooperation with various sectors to support this program.

ACKNOWLEDGEMENTS

The author would like to thank Universitas Kristen Satya Wacana and Faculty of Medicine and Health Sciences for the chance and financial support to present this paper in International Conference on Public Health.

REFERENCES

Anand, K; Lakshmy R; Janakarajan VN; Ritvik A; Misra P; Pandey RM; Kapoor SK; Sankar R; Bulusu S.: "Effect of consumption of micronutrient fortified candies on the iron and vitamin a status of children aged 3-6 years in Rural Haryana", *Indian Pediatrics*. 44:823-829, 2007.

Alcazar L,"*The Economic Impact of Anaemia in PERU"*, [retrieved on 20150315], Peru (PE): GRADE Action Against Hunger, 2013.

Alavi, S; Bugusu B; Cramer G; Dary O; Lee TC; Martin L; McEntire J; Wailes E.: "*Rice fortification in developing countries: A Critical Review of the technical and economic feasibility*", Washington (US): Academy for Educational Development, 2008.

Allen, LH.: "Iron supplements: scientific issues concerning efficacy and implication for research and programs"*, J Nutr*.132: 813S–819S, 2002.

Allen LH, "Iron deficiency anaemia and pregnancy outcome", *Am J ClinNutr*.71(suppl):1280S–4S, 2000.

Allen,L; de Benoist, B; Dary, O; Hurrell, R.: "*Guidelines on food fortification with micronutrients"*, Geneva (CH): WHO Library Cataloguing-in-Publication Data, 2006.

Al-Zabedi, EM; Kaid FA; Sady H; Al-Adhroey AH; Amran AA; Al-Maktari MT, "Prevalence and risk factors of iron deficiency IDA among children in Yemen", *American Journal of Health Research*. 2(5): 319-326, 2014.

Arisman, "*Gizi Dalam Daur Kehidupan*", Jakarta (ID): Penerbit Buku Kedokteran EGC, 2007.

Assefa S; Mossie A; Hamza L, "Prevalence and severity of IDA among school children in Jimma Town, Southwest Ethiopia", *BMC Hematology*, 2014.

Baltussen, R; Knai C; Sharan M, "Iron fortification and iron supplementation are cost-effective interventions to reduce iron deficiency in four subregions of the world", *J Nutr*.134: 2678–2684, 2004.

Bhutta, ZA; Das JK; Rizvi A; Gaffey MF; Walker N; Horton S; Webb P; Lartey A; Black RE.: "Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost?", *The lancet*, S0140-6736(13)60996-4, 2013.

Falkingham, M; Abdelhamid A; Curtis P; Fairweather-Tait S; Dye L; Lee H.: "The effects of oral iron supplementation on cognition in older children and adults: a systematic review and meta-analysis". *Nutrition Journal*. 9:4, 2010.

Horton, S: "The economics of food fortification", *American Society for Nutrition*, 2006.

Kassebaum, NJ; Jasrasaria R; Naghavi M; Wulf SK; Johns N; Lozano R; Regan M;Weatherall D; Chou DP; Eisele TP, "A systematic analysis of global agb burden from 1990 to 2010", *American Society of Hematology*, 2013.

Kavle JA; Stoltzfus RJ; Witter F; Tielsch JM; Khalfan SS; Caulfield LE, "Association between anaemia during pregnancy and blood loss at and after delivery among women with vaginal births in Pemba Island, Zanzibar, Tanzania" *J HEALTH POPUL NUTR*. 26(2):232-240, 2008.

Kotecha, P.V; Nirupam, S; Karkar P.D.: "Adolescent girls' anaemia control programme, Gujarat, India", *Indian J Med Res 130*, pp 584-589, November 2009.

Le, HT; Brouwer ID; Burema J; Nguyen KC; Kok FJ.: " Efficacy of iron fortification compared to iron supplementation among Vietnamese school children", *Nutrition Journal.* 5:32, 2006.

MacDonald, C, et al.:"A case study: Effectiveness of a large-scale, integrated, multiple-intervention nutrition program on decreasing anaemia in Ghanaian & Malawian women", http://www.wvi.org/sites/default/files/Anaemia-Ghana-Malawi-Chapter.pdf, 2002.

Mathers C; Steven G; Mascarenhas M, "*Global health risks: mortality and burden of disease attributable to selected major risks*", Geneva, Switzerland (CH): World Health Organization, 2009.

Martorell, R.: "Effectiveness Evaluation of the Food Fortification Program of Costa Rica: Impact on Anaemia Prevalence and Hemoglobin Concentrations in Women and Children", *Micronutrient Initiative*, Ottawa, Canada, 2014

Mora, JO.: "Integrated Anaemia Control Strategy has significantly reduced anaemia in women and children in Nicaragua, *Micronutrient Initiative,* 2007.

Moretti, D; Lee TC; Zimmermann MB; Nuessli J; Hurrell RF.: "Development and evaluation of iron-fortified extruded rice grains", *Journal of Food Science*. 70(5), 2005.

Susanti, Y; Briawan, D; Martianto, D.: "Suplementasi Besi Mingguan Meningkatkan Hemoglobin Sama Efektif Dengan Kombinasi Mingguan Dan Harian Pada Remaja Putri", *J. Gizi Pangan*, 11(1):27-34, Maret 2016.

WHO/WFP/UNICEF, "Preventing and controlling micronutrient deficiencies in populations affected by an emergency", WHO, 2006.

World Health Organization (WHO), "*Worldwide prevalence of anaemia 1993–2005*", Geneva (CH): WHO Library Cataloguing-in-Publication Data, 2008.

Zamani, AR; Farajzadegan, Z; Ghahiri, A;Khademloo, M; Golshiri, P.: "Effectiveness of twice weekly iron supplementation compared with dailyregimen in reducing anaemia and iron deficiency during pregnancy:a randomized trial in Iran", *JRMS*, ; 13(5): 230-239, 2008.

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Family Support for Men Participation in Posyandu

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Article Info
Keyword:

Participation,
Father's care,
The children under five
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ABSTRACT

The caregiver of posyandu are usually women. However, in the village of Rejoagung, Ploso, Jombang, starting from May 2016, a posyandu with male caregivers and cadres was introduced. The involvement of both parents in posyandu is essential in monitoring the growth of toddlers. The purpose of this study is to explore family supports on men participation in posyandu. This is a descriptive study with qualitative approach. The participants were male and female caregivers and his/her family. The data collection techniques uses literature study, observation and direct interviews. The results showed that family support influences men participation in posyandu. Family supports encompasses informational support, assessment support, instrumental support and emotional support. Among the forms of family support, informational support gave the most influence for men to engage in posyandu. It is expected that men participation in posyandu will contribute to an all inclusive posyandu

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1. INTRODUCTION

The achievement of POSYANDU depends on whether or not the community participated in succeeding POSYANDU program itself. It is common that POSYANDU ambience is dominated by women. However, this is not the case for the POSYANDU filled with men who take care of their children of under five years old in Rejoagung Village, which was formed in the early May of 2016. Concern and involvement of men cadres in POSYANDU are expected to be a good form of cooperation between men and women as parents in monitoring the children growth. FATHER POSYANDU is the first to be founded in Rejoagung village and is expected to become a pioneer. FATHER POSYANDU in Jombang is the first POSYANDU for men in Indonesia. The purpose of this research is to find out family support to the father care participant toward children under five years old in POSYANDU.

The participation of caring of men is influenced by several internal and external factors, such as knowledge, length of stay, age, occupation, habits, needs, family support, POSYANDU location, support of community structure, and benefits gained from participating in POSYANDU activities (Green, 2005).Green and Kruater (2005)mentioned that family support is an element of reinforcing the behavior of one's health or society. Men as fathers will actively take their children to POSYANDU if there is encouragement from the nearest person including family. Family supports in the form of informational support, assessment support, instrumental support and emotional support are needed (Ndraha, 1990).

The role of a father since mother's pregnancy, childbirth and parenting is important to be done since it is the responsibility of the father. Many husbands do not know the development of their child's growth. The importance of the father in supporting the mother in parenting will provide a sense of togetherness and shared responsibility as parents. Family is the smallest unit in the process of health care in the community, whereas good family health will affect health status in the society. To make this happen,

supports from family members are necessary. Family support is the best preventive intervention strategy to help family members access undisclosed social support for an aid strategy aimed at enhancing adequate family support. Family support is instrumental in the successful participation of fathers to care about the growth and development of their children.

2. RESEARCH METHOD

This research type is descriptive research with qualitative approach. Researchers tried to find facts and then described family support for the participation of men in caring the children under five in Men POSYANDU. The selection of the participants was done by using purposive non-probability sampling technique. The research subjects (informants) in this research were the fathers who took their children to Men POSYANDU in Rejoagung Village, Ploso, Jombang and his family, with a total of eight participants. The data collection technique used in this research was in-depth interviews, observation, documentation and literature study. Researcher used examination technique to test the data validity which was triangulation technique. The data analysis was done interactively through process of data reduction, data presentation, and verification or conclusion.

3. RESULTS AND ANALYSIS

General description of children under five years inPOSYANDU in Rejoagung Village, Ploso, Jombang

The Location of this study was POSYANDU of Citizens Association (RW) 5 Rejoagung Village, Ploso Jombang District. This sub village was the only village in Rejoagung village that had founded Father POSYANDU. This POSYANDU was carried out by POSYANDU cadres of RW 5, both male and female cadres. At the beginning of the operation of this POSYANDU, there were 6 cadres which were all mothers. When Father POSYANDU was established, this POSYANDU had had 2 male cadres. The establishment of POSYANDU in caring the children was conducted by the team leader of PKK Jombang, in cooperation with STIKES Pemkab Jombang at the beginning of May 2016. The POSYANDU was the second Men POSYANDU existing in Jombang which accommodated the participation of fathers. The cadres who served at the POSYANDU which was for children aged less than five years old were active cadres, as seen from their presence in every POSYANDU activity.

The financing for the RW 5 POSYANDU activities was from the funding from the government, as well as the contribution from the non-binding community. The Implementation of activities had been settled in a post which was the house of one of the POSYANDU cadres. The inventory owned by the POSYANDU included baby scales, *dacin* scales (balance scales), standing scales, and height gauges. The information contained in KMS of each child included child biodata, immunization notes, vitamin A capsule delivery, weight and height monitoring and information on the importance of immunization and breastfeeding, diarrhea treatment and nutrition counseling. This POSYANDU also had R / 1 monitoring form which was a list of monthly records containing the results of monitoring of infants who came to the POSYANDU. This list contained information such as the child's name, registration number, first visit date, weight and height at the first visit, and the weight and height monitoring for each time they came to the POSYANDU.

The service provided was a five-table service for babies and children under five years. Services for infants and children under five years at the start of registration, weighing, card recording. The age of children who come to this POSYANDU ranged from 0 months to 60 months old. All children under five years got weighing services, weight and height measurements, vitamins, immunizations by midwives, and supplementary feeding.

Family Support to Father's Participation Concerning his Children in Health Care Service

From the results of research findings in Men POSYANDU in Rejoagung Village, Ploso, Jombang, it can be seen that the participation of caring father who brought

his children and husband who accompanied his wife to POSYANDU every month was an effort to improve health services. It is because the concern and involvement of the father was a form of cooperation between father and mother as parents in monitoring the growth of their children to realize the generation of children with great health, good attitude, and noble virtuous character. There are 8 (eight) fathers who actively participated by taking their children to POSYANDU almost every month, either alone or together with their wives. It is in line with information provided by a 27-year-old father named 'S', "There are only 8 fathers who routinely bring their children to POSYANDU".

Active participation of fathers of children under five years to bring their children every month to POSYANDU would support children health services in POSYANDU to achieve the maximum level of health for children under five. The state of children's health could not be separated from the role of parents, both mother and father, who had an obligation to always pay attention to their children's health. To maintain their toddler's health as parents, mothers and fathers made various efforts such as maintaining the quality of food consumed by children and taking their children to POSYANDU so that their health could be monitored optimally, including the weight, height, nutritional status and immunization given. There were several factors that influenced the participation of parents, especially father and male cadres, in their effort to monitor the toddler's health in POSYANDU in RW 5. Those factors are divided into two namely internal factors and external factors.

The internal factors could be seen from the existence of good knowledge about the importance of health and understanding the importance of good health for children. This situation encouraged them to participate and make use of POSYANDU services. Similarly, long-lived factors such as ages, habits and occupations (with a majority of farmers, entrepreneurs and traders) demotivated them to participate in children health services at POSYANDU. The external factors that influence father participation were the support of family (wife and parents), support of POSYANDU cadres, and the location of POSYANDU. Whereas, the location of POSYANDU was relatively close to their houses and could be reached by foot. In terms of organization, the majority of participants did not have organizational experience but still participate in POSYANDU services.

The absence of awards did not decrease participants' enthusiasm to take part in toddler health services at POSYANDU, by routinely utilizing POSYANDU services. This was primarily driven by a strong desire to know the growth and development of their children. POSYANDU benefits were obviously felt by them since they participated in the program. The existence of family support made the participants confident when participating in health services by taking their children to POSYANDU. The participants' opinions was represented by one of the fathers, a 30-year-old father named "M", who took his children to POSYANDU, "By joining and participating in POSYANDU programs, I gain my knowledge in the fields of child health, immunization, and vitamin delivery". This statement was also justified by other fathers.

All informants said that they felt the benefits of POSYANDU, such as getting additional knowledge about health problems, getting opportunity to monitor children's growth, knowing how to give vitamins and immunization. Thus, it could be concluded that the informants wanted to participate in the health services for toddlers because they gained benefits from the health services offered by POSYANDU. It is in line with the theory stating that the usefulness of POSYANDU program is a factor that influences the participation of the people(Bandura, A., 1977).

According to the participants, one of the factors that influenced them to bring their children to POSYANDU was family support. According to the fathers' statements, the family strongly supported their participation in POSYANDU. One 35-year-old participant named "R" said, "Family support is very meaningful in motivating me to take part in POSYANDU activities". Another father aged 31 year with the name of "G" said, "I always try to accompany my wife every month to POSYANDU. My wife is also very happy and supportive". The statement was supported by his 27-year-old wife by saying, "Yes, my husband always took the children to POSYANDU. Sometimes, even if I could not go, he took the children to POSYANDU b himself. I am very supportive of him because it helps me a lot". A 25-year-old mother named "H" said "I strongly support my husband to take

our son to POSYANDU because it helps us monitor the growth and development of child".

Based on in-depth interviews with the participants, the most influential form of family support for the participation of caring fathers to take their children to POSYANDU was informational support, where families become the informers (Ndraha, 1990). According to “I”, aged 25, "My family always reminded me about POSYANDU schedule. Coincidentally, my in-law is the chairman of POSYANDU cadres in RW 5. She always told me about a POSYANDU program the day before". This statement was justified by the chairman of POSYANDU. She says "I always informed the community as well as my daughter-in-law at home to participate in the POSYANDU program one day before it was organized”.

So it can be concluded that the support of family has a positive relationship with father participation in taking his children to POSYANDU. According to Green theory, 1980, the reinforcing factor for a person to lead a healthy life is mainly because of family support. Behavior to plan a posture is influenced by 1) the previous related behavior consisting of perceived benefits to an action, perceived barriers to action, perceptions of beliefs, effects arising from activation, 2) personal factors consisting of family, group, health care provider, norm, and model support. Situational influences: the choices available, the characteristics and aesthetic needs that will affect a person's health promotion (Ife, 2008).

A father’s behavior in providing stimulation for the growth and development of his toddlers will be improved when added with self-efficacy. Before a person has a good commitment in health promotion behavior, he/she will be affected by the healthy behavior that he/she has not done. A commitment is a determination or motivation that affects a person to perform an action. Little commitment makes a person often abandon the behavior. If a father has a little commitment, the behavior in providing stimulation of growth and development will be affected, that will ultimately affect the growth and development of his toddlers. He must promote healthy behavior to show that they are committed. A father must have the confidence in his own ability that he is able to provide stimulation for growth and development for his toddlers. A father is the closest person after a mother because he is also responsible in the growth and development of his children. A father also wants to be involved in the growth and development of his toddler. He will be proud to see his child grow and develop optimally. In order for the father to have the ability (self-efficacy) in stimulating the growth of his children, he is required to have the knowledge in providing stimulation.

4. CONCLUSION

Participation done by fathers to participate in father’s POSYANDU in caring the children in effort of health service of children was influenced by some factor that were divided into two factors, internal and external factors. Internal factors consist of education factor, length of stay, age, habit and work. External factors include support from cadres, family support (especially wife’s support), and the ease of reaching the POSYANDU location.

Family support that influences the participation of caring father to take his children to POSYANDU was in the form of informational, assessment, instrumental and emotional supports. Among those forms of family support, informational support gave the most influence to the participation of fathers to take their children to POSYANDU. Family, especially wife and parents strongly support the father to participate and take the children to POSYANDU. Family support, especially informational support, motivated fathers to participate regularly in POSYANDU programs. It was suggested that the POSYANDU cadres and the community, especially fathers, had to be concern about and actively participate in POSYANDU in RW 5, Rejoagung village as an effort to provide health services for children so that it can become POSYANDU pioneer.

This POSYANDU for men as a father will be a pioneer because it is the first POSYANDU in Jombang regency as well as in Indonesia that accommodate the participation of fathers to take their children of under five years to get health services and accommodate the participation of men to become cadres for children under five years old. Hopefully, the Father POSYANDU can develop and become an independent POSYANDU

that will continue to innovate and look for new breakthroughs to deal with existing problems. The weakness of this study is the limited literature about POSYANDU for fathers that can be used for the basis of the research and the small number of fathers who participated in this POSYANDU. Thus, there is a need for further research on factors - factors that influence the participation of parents, especially fathers and male cadres, in health service for children under five in POSYANDU with more participants, so that the results can be generalized.

REFERENCES

Bandura, A., 1977. Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, pp.191–215.

Friedman, Marilyn M. 2010. *Buku ajar Keperawatan keluarga : Riset, Teori dan Praktek*. Jakarta: EGC

Green, LW. And Kreuter, M. W. 2005. Health Program Planning: An Educational and Ecological Approach. 4th edition. Ny: McGraw-Hill Higher Education

Ife,Jim & Frank Tesoriero. 2008. *Community Development: alternative Pengembangan Masyarakat di Era Globalisasi*. Yogyakarta: Pustaka Pelajar.

Ndraha, Talizihutu. 1990. *Pembangunan Masyarakat: Mempersiapkan Masyarakat Tinggal Landas*. Jakarta :RinekaCipta

The Relations Between Anemia and Female Adolescent's Dysmenorrhea

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Article Info

Keyword:
Anemia,
Dysmenorrhea,
Female adolescents.

ABSTRACT

Dysmenorrhea described as painful cramps in the lower abdomen that occur during menstruation and the infection indications, pelvic disease moreover in the severe cases it caused fainted. The women who complained dysmenorrhea problems mostly are who experience menstruation at any age. That means there is no limits age and usually dysmenorrhea often occur with dizziness, cold sweating, even fainted. In some countries the dysmenorrhea problem happens quite high as happened in the United States found 60-91% while in Indonesia amounted to 64.25%. as many as 45-75% of female adolescent experienced dysmenorrhea with the chronic or severe pain that effected to their everyday activities The number of teenagers who experience dysmenorrhea is due to high cases of anemia, irregular exercise, and lack of knowledge of nutritional status. In the previous study there are 85% of female adolescent experience dysmenorrhea. The method of this study is a correlational method with cross sectional approach. The data collecting method examining Hb levels. The population and sample of this study was 40 female adolescent The result showed that the female adolescent who had dysmenorrhea with anemia was 26 (92.4%). From the calculation by Exact Fisher the correlation between anemia and dysmenorrhea cases among female adolescent P <0.05 and p = 0.003, there was significant correlation between adolescent's dysmenorrhea. Based on the result of statistic analysis, it can be concluded that the anemia can be categorized as one of dysmenorrhea causes. Anemia is one of the constitutional factors that cause lack of endurance of the body to gainst.

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1. INTRODUCTION

Women has to go through a natural regular process namely menstruation. They experience it monthly, especially in the productive age. Usually, the menstrual cycle begins at the age of adolescents, i. e. 9-12. Menstruation has several cycles controlled by hormonal interactions (J Dobson, 2006). Hormone interactions will make the decay of the uterine wall removed through the vagina. During menstruation, women will feel tense and excruciating feelings. Many women in the productive age feel discomfort during menstruation, although menstruation comes regularly. The discomfort can be an emotional or pain disorder that often interferes with daily activities (N. Fajaryati, 2012).

Dysmenorrhea is often described as pain in lower abdominal that occurs before and during menstruation. Dysmenorrhea can be identified as a sign of infection or pelvic disease and may occur when it causes fainting in a more severe case. Teenagers often experience dysmenorrhea, which ranges in pain from mild to severe, starting from cramps in the middle of the womb to interfering with everyday activities, especially for adolescents with high physical activity at school. Dysmenorrhea problem can be experienced by women of any age. There is no age limit and dysmenorrhea is often

accompanied by aggravating condition. Almost all women experience dysmenorrhea with various levels, ranging from mild cramp to excruciating pain (Mardilah, 2014).

Primary dysmenorrhea is menstrual pain apparent without cause. It begins immediately after menarche and is not related to physical causes. Whereas, secondary dysmenorrhea is the result of various abnormal or pathological conditions such as in salpingitis, congenital uterine anomaly, endometritis, or congenital Müller duct disorder. Secondary dysmenorrhea is also called extrinsic dysmenorrhea which can occur in women who never experiences dysmenorrhea previously, either before or during menstruation (I. Novia, 2008).

Abdominal cramp pain occurs in primary dysmenorrhea and starts to occur in every woman within 24 hours before menstruation. It can occur for 24 to 36 hours. Cramp pain in dysmenorrhea is mainly felt in the lower abdomen and can spread to the back, as well as the inner surface of the thigh. In addition, dysmenorrhea can also be accompanied by nausea and vomiting, headache, diarrhea and irritability feeling (I. Novia, 2008). Dysmenorrhea usually occurs due to the excessive release of certain prostaglandin hormones from uterine endometrium cells that stimulate strong contractions of the myometrial smooth muscles and uterine blood vessels. As a result, it aggravates uterine hypoxia that normally occurs in menstruation. Consequently, severe pain arises (S. Prawiroharjo, 2012).

Many factors causing dysmenorrhea include endocrine, psychological state, constitutional state, allergy, cervical canal obstruction, endometriosis, adenomyosis and exercising. Besides, the high incidence of anemia in most young women may also lead to dysmenorrhea, exercise irregularities, and lack of knowledge about nutritional status. In addition, there are some conditions that can increase the risk of dysmenorrhea, including menarche at an earlier age, women who have never been pregnant and give birth, longer period of menstruation compared to normal one (7 days), andage (Mardilah, 2014).

During menstruation there is an estrogen/ progesterone hormone imbalance. The hormone is decreased, resulting in tissue damage through ischemia which leads to the release of phospholipids, arachidonic acid and calcium ions, as well as the production of prostaglandins and vasopressin leading to dysmenorrhea. As a result, blood, along with the oxygen, cannot reach certain parts of organs and causes ischemia. If an ample amount oxygen is brought in the red blood cells, the supply of oxygen to various organs will be achieved, thus reducing the risk of ischemia (Bobak, 2004).

Hemoglobin, which has the function of binding oxygen (O2), is present in the red blood cells. The normal value of a woman's hemoglobin level is 12-16gr / dl and if one's hemoglobin level is less than 12 grams%, then she is anemic. Anemia can be divided into 3 types, i. e. mild anemia (hemoglobin level of 10 grams%), moderate anemia (hemoglobin level of 7-9 grams%) and hemoglobin anemia(hemoglobin level of less than 6 grams%). The incidence of dysmenorrhea occurring in some countries is quite high. In Indonesia, for example, the number of dysmenorrhea is 64.25%. As many as 45-75% of young women have dysmenorrhea with severe pain which results in temporary paralysis activity (Erlina, 2014).In the preliminary study conducted by researchers, 85% of adolescents experienced dysmenorrhea. Therefore, the researchers are interested to know the correlation between anemia and dysmenorrhea in young women.

2. RESEARCH METHOD

This research use analytical design with cross-sectional method. This study aims to find out the relationship between constitutional factors (anemia) with dysmenorrhea in young women. The population in this study was adolescent girls aged 18-20 with a sample of as many as 40 female teenagers. The sample in this study was obtained through simple random sampling.

The operational definition of independent variables, which was anemia, was done by measuring hemoglobin levels in non-anemic female adolescents (hemoglobin level of ≥ 120 gr/ dl) and anemic female adolescents (hemoglobin level <12 g/ dl). The hemoglobin level was measured with Hb Sahli method. The Hb level was then examined classified by criteria. Meanwhile, the data about the dependent variable (dysmenorrhea, the pain felt at the time of menstruation) was obtained through questionnaire. There were two criteria for analyzing dysmenorrhea case in this research: dysmenorrhea (experiencing pain during menstruation) and non-dysmenorrhea (never experiencing pain during menstruation). The dysmenorrhea data were collected by using questionnaires by distributing questionnaires to young women and then analyzing the answers after classifying those with dysmenorrhea and those without dysmenorrhea.

This study used closed questionnaires as the data collection instrument. On the other hand, the hemoglobin level was analyzed using Hb Sahli made by Harenz. The data used in this study were in the form of primary data that were obtain by distributing questionnaires about dysmenorrhea and examining hemoglobin levels of young women.

Sequentially, the data collected was processed manually before being analyzed. The data were analyzed using Chi Square test method and presented using frequency table and cross table. It had a confidence level of 95% (α = 0.05) and was presented in cross tabulation with the following criterion of assessment: if x2 count> x2 table, then H0 (null hypothesis) was rejected, meaning that there was a relationship between anemia and dysmenorrhea. If the expectation frequency table did not meet the requirement, where cells with expected frequency of <5 were more than 20% of the total cells, the data would be calculated with Exact Fisher test.

3. RESULTS AND ANALYSIS

Data from 40 young women which had been collected was then processed and grouped with the following results:

3.1 Anemia in Young Women

Table 3.1. Anemia distribution among female adolescents

Anemia	Total	Percentage
Non-anemic	12	30 %
Anemic	28	70%
Total	40	100%

Table 3.1 shows that most of the adolescent girls experience anemia, with a total of 28 girls (70%).

3.2 Anemia Classification of Anemia Degrees on Young Women

Table 3.2. Distribution of classification of anemia degree in female adolescents

Classification of Anemia Degrees	Total	Percentage
Mild	13	46.5 %
Moderate	14	50 %
Severe	1	3.5 %
Total	28	100 %

Table 3.2 shows that half of girls are moderately anemic with a total of 14 girls (50%) and nearly half of the girls have mild anemia with a total of 13 (46.5%) and a small proportion of 1 adolescent has severe anemia (3.5%).

3.3 Description of Dysmenorrhea in Young Women

Table 3. Distribution of dysmenorrhea in young women

Dysmenorrhea Occurrence	Total	Percentage
Experiencing dysmenorrhea	35	87.5 %
Not experiencing dysmenorrhea	5	12.5 %
Total	40	100

Table 3.3 shows that almost all teenage girls experience dysmenorrhea with as many as 35 girls (87.5%)

3.4 Cross-tabulation of the Relationship between Anemia and Dysmenorrhea in Young Women

Anemia	Dysmenorrhea				Total	Fisher Exact test (1-sided)
	Experiencing		Not experiencing			
	N	%	N	%		
Non-Anemic	8	66,7 %	4	33,3 %	12 (100%)	0,003
Anemic	26	92,8 %	2	7,2 %	28 (100%)	
Total	35	87,5 %	5	12,5%	40 (100%)	

From the data above, it can be concluded that almost all teenage girls experienced dysmenorrhea with a total number of 26 (92.8%), compared to female teenagers who were not anemic with a total number of 8 (66.7%). Meanwhile, the number of teenage girls who did not experience dysmenorrhea without anemia was twice as many as those with anemia with a total of 4 (33.3%), compared to those without anemia with a total number of 2 (7.2%).

The analysis on the relation of anemia and dysmenorrhea in adolescent female by using Exact Fisher test resulted in a P value of <0.05 whereas P = 0.003.Thus, Ho is rejected which means that there is a relationship between anemia and dysmenorrhea in adolescent girls. Therefore, based on the results, it can be concluded that anemia is one of the factors that can lead to dysmenorrhea. This is in accordance with the existing theory that one of the factors causing decreased endurance in feeling pain is anemia. As a result, at the time of menstruation, it may cause dysmenorrhea. Anemia is a condition of insufficient blood hemoglobin level in the body. The function of hemoglobin is to bind oxygen which is then circulated throughout the body. If the hemoglobin level in the blood is less than the oxygen level, the oxygen cannot be channeled to the blood vessels in the reproductive organs which then will undergo vasoconstriction resulting in pain. Conversely, if the hemoglobin level that binds and carries oxygen in red blood cells is high, the tissue needs will be met. In addition, the exclusion of phospholipids, arachidonic acids, calcium, prostaglandin ions and vasopressin are caused by ischemia, where prostaglandins and vasopressin can cause spiral artery vasoconstriction and can lead to upper endometrial ischemia that can release many phospholipids, leading to more prostaglandin expenditure that eventually will result in dysmenorrhea.

Every month, young women experience menstruation. As a result, every woman needs iron which iron can be one of the things that can cause dysmenorrhea. Iron deficiency or the so-called anemia can affect daily activities and can lead to decreased concentration of learning. Anemic patients have greater potential to experience decreased memory and low problem solving skills which will result in bad learning achievement. The results of this study are in accordance with research conducted by Endang Wahyuningsih on "The relationship of hemoglobin levels with the incidence of dysmenorrhea in high school students of SMA Negeri 1 Wonosari Klaten" which showed that anemia was one of the factors causing dysmenorrhea (Wahyuningsih, 2015).

The results of the study showed that adolescents who were not anemic have mild or moderate dysmenorrhea. Meanwhile, those who had anemia had different degrees of mild, moderate and severe of dysmenorrhea. This is possible because there are still many factors that cause dysmenorrhea other than anemia. Among those are psychological factors, sports factors, nutritional status factors, and endocrine factors. The possible psychological factors are emotional instability and unpreparedness of development and growth that occurs to her. In terms of sports, moderate exercise is recommended to reduce dysmenorrhea as it is one of the relaxation techniques to reduce pain. This is because at the time of exercise, the body will produce endorphin hormone which is a natural sedative produced by the brain so it can cause a sense of comfort.

Beside these factors, there is also pain factor that can affect dysmenorrhea. Pain is a form of sensory discomfort that is subjective with an unpleasant emotional experience and has varied level depending on one's pain threshold. Pain is also a mixed physical, emotions and behavior reactions of a person associated with actual tissue damage. Tolerance and pain responses differ from one person to another.

Based on the results of the study, half of the girls or as many as 14 people from 40 young women have moderate anemia. The level of hemoglobin in girls is influenced by many factors, including blood loss from menstruation, chronic illness, the lack of iron in the food consumed, the imbalance between nutritional intake, their activities, and the changing lifestyle. Lack of hemoglobin prevents body's metabolism and nerve cells from working optimally, disrupting the dopamine receptor system which causes a decreasing pattern of nerve impulse impingement.

4. CONCLUSION

Based on the analysis of Exact Fisher test data, it can be concluded that there is a correlation between anemia and dysmenorrhea in young women so that anemia is one factor that causes dysmenorrhea. There are several other factors that cause dysmenorrhea. Thus, further research can investigate these factors.

ACKNOWLEDGEMENTS

Let us say thanks to:

a. All study respondents

b. Dean of Faculty of Health Sciences Muhammadiyah University

REFERENCES

Bobak, *Buku Ajar Keperawatan Maternitas*. Jakarta: EGC, 2004.

I. Novia, "Faktor Risiko yang Mempengaruhi Kejadian Dismenore Primer."The Indonesia Journal of Public Health, Vol.4 Nomor 3, 2008 ISSN 1829-7005

J. Dobson, *Menjelang Masa Remaja*. Jakarta: Gunung Mulia, 2006.

Mardilah, "Faktor-Faktor yang Mempengaruhi Pengetahuan Remaja Putri Dalam Menghadapi Menarche di SMP Negeri 5 Darul Makmur." KTI. 2014

N. Fajaryati, "Hubungan Kebiasaan Olahraga Dengan Dismenore Primer Remaja Putri Di Smp N 2 Mirit Kebumen," *J. Komun. Kesehat.*, vol. 3, pp. 2–3, 2012.

Rustam, Erlina. "Gambaran Pengetahuan Remaja Puteri Terhadap Nyeri Haid (Dismenore) dan Cara Penanggulangannya," *J. Kesehat. Andalas*, vol. 3, no. 1, pp. 286–290, 2014.

S. Prawiroharjo, *Obstetri Fisiologi*. Jakarta: Yayasan Bina Pustaka, 2012.

Wahyuningsih, Endang "Hubungan kadar hemoglobin dengan kejadian dismenore pada siswi kelas XI SMA Negeri 1 Wonosari Klaten." Jurnal Pendididkan dan Pelayanan Kebidanan Indonesia. Vol. 1 Nomor 2 Tahun 2015

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Return to Work Program for Improving Quality of Life (QoL) of Worker with Disability Caused by Accident: A Review of the Regulation and Implementation in Indonesia

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Article Info

Keyword:

Return to work,
Quality of life,
Worker with disability,
Accident

ABSTRACT

Loss in quality of life is the consequence of injury and disability. Any worker with disability caused by accident is entitled to get return to work program benefit. This program includes medical service, rehabilitation and work training. The benefit is provided by the national social security for workers (BPJS Ketenagakerjaan). BPJS Ketenagakerjaan monitors and evaluates the workers untiltheir post placement, that is is when the workers have returned/ started to do their previous/ new jobs. The aim of this paper was to study the regulation and aplication of return to work program for improving quality of life of worker with disability caused by accident. This study was a literature review focused on the regulation and implication of return to work program in Indonesia.The regulation related to the return to work program include:Law number 13 of 2003 concerning manpower, the government regulation number 44 of 2015 on work accident and casualty security program implementation, regulation of Minister of Manpower number 10 of 2016 concerning the mechanism of return to work program as well as promotional activities and preventive actions to occupational accident and occupational desease. The government institutions (Ministry of Health, Ministry of Manpower, dan Ministry of Social Affairs), along with the companies and training centers have been cooperating in realizing this program through a multisector collaboration. Based on the results, it can be concluded that the return to work program was adequate to improve the quality of life of workers with disability.

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1. INTRODUCTION

The number of occupational accidents increases each year, it reaches about 103,000 cases (BPJS Ketenagkerjaan, 2015).The impacts of occupational accident are partial anatomical disability, partial functional disability, permanent total disability and fatality.

The workers with disability have limitations in many aspects of their life in social and economic contexts (Mitchell, 2005).Socio-economic risks to workers with disabilitysuffering from workplace accidents are;

a. Medical treatment and rehabilitation (Santana, 2006),which are much needed for laborersstarting from the occurrence of accidents to recovery.
b. Losing a job. New jobs are very difficult to obtain even with lower wages (Bratsberg, 2013).Although the disabled have a strong desire for working, the percentage of their getting a job is lower than that of the non-disabled(Kwang Lee, 2016).
c. Loss / decrease of income because the possibility of work / career is very limited to the disabled (Kwang Lee, 2016).

d. Emotional (Santana, 2006), especially for the disabled. The presence of feelings is meaningless, useless, frustrated to depressed.

Socioeconomic status and income decrease are reported as factors affecting the quality of life of workers with disability(Kwang Lee, 2016).They experienced various disabilities that limits their performance either in daily living activities, work or leisure activities which subsequently decrease their quality of life (Murad, 2016). According to Kitis (2017), disability affects the quality of life. Disability status limits their participation in the work field, thus increasing the financial burden. Socioeconomic status and income are affecting the quality of life (Kwang Lee, 2016).

There are strategies/ approaches to helpindividuals with disabilityas an effort to improve their socio-economic status, which are by removing physical and social barriers, creating accessibility through universal modification and design, and promoting health and well being. Disability studies are mostly done to provide solutions in an effort to remove physical and social barriers.

Some disability studies have been used to develop policies / regulations, especially in the preparation of programs for workers with disability and social security disability insurance, to maximize the quality of life of a worker with disability(Costanza, 2008).Social security disability insurance is vital for the worker (Ruffing, 2012).

Indonesian Government has established new policies and programs to maintain/ improve the quality of life of workers with disabilitysuffering fromoccupational accidents. BPJS Ketenagakerjaan is authorized to administer work accident and death insurance programs, and return to work program. The program can ensure the long-term life of workers with disability due to workplace accidents.

The aim of this study is to study the regulation and implementation of return to work (RTW) of worker with disability caused by accident in Indonesia.

2. RESEARCH METHOD

This study was a literature review as observational study which was conducted by reviewing regulation related to return to work program and implementation of return to work program in Indonesia, as well as reviewing several journals related to quality of life, workplace accidents and disability.

3. RESULTS AND ANALYSIS

According to Beth P. Veide, quality of life is the most important in the existence of life (Brown, 1997). The quality of life of worker with disability suffering from occupational accidents can be enhanced through various efforts, including insurance (occupational accident insurance) and RTW program that is reinforced by enactment of regulations to regulate the implementation.

3.1 Quality of Life ofWorker with Disability

According to WHO, Quality of life is an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, values and concerns incorporating physical health, psychological state, level of independence, social relations, personal beliefs and their relationship to salient features of the environment quality of life refers to a subjective evaluation which is embedded in a cultural, social and environmental context (Susniene, 2009).

According to David Felce and Jonathan Perry (Brown, 1997), Quality of life is a multi-dimensional and multi-element concept. The quality of life of the disabled includes 5 domains, physical well-being, material well-being, social well-being, emotional well-being, and productivity well-being. Physical well-being is concerned with physical ability to do specific activity. Material well-being is concerned with financial condition and property to support life. Social well-being is concerned with personal relation to their community. Emotional well-being is concerned with psychical conditon. Productivity well-being is related to person's ability to use time with functional activities.

3.2 The Regulation Related to Return to Work Program

Compensation is a prime requirement for independent living. Work contributes to the reconstruction of life and social functions. Regulation and promotion of the employment of people with disability appear to play a bigger role for their quality of work (Agovino, 2014). Indonesian Government has developed several regulations to support implementation of RTW program as an

effort to provide protection to disabled workers. Regulations related to RTW program implementation:

3.2.1 Law Number 13 of 2003 Concerning Manpower

There are several important articles related to RTW. According to Article 5, every person available for a job shall have the same opportunity to get a job without discrimination. Article 99 states that workers/ labourers and their families shall each be entitled to social security for employees. Meanwhile, Article 153 states that the employer is prohibited from terminating the employment of a worker/ labourer because the worker/ labourer is disabled as a result of a work accident (Manpower Rule, 2003)

3.2.2 Regulation of The Government of The Republic of Indonesia Number 44 of 2015

This regulation regulates work accident and casualty security program implementation. According to Article 1, work accident is an accident which occurs in an employment relationship, including accidents on the way from home to the workplace or otherwise and diseases due to the work environment. Work Accident Security, hereinafter referred to as JKK, is a benefit in the form of cash and/or health services provided when participants have a work accident or disease due to the working environment.

According to Article 25, manpower that experiences a work accident shall be entitled to the accidents insurance benefits, i. e.:

A. Medical services in accordance with the medical need, including:
   1. Cash compensation, including: Reimbursement of participant's transportation costs, in which the participant suffers from a work accident or occupational disease, to the hospital and/or his home, including costs of first aid in the accident;
   2. Temporary benefits while he is unable to work;
   3. Compensation for partial anatomical disability, partial functional disability, and permanent total disability;
   4. Casualty compensation and funeral expenses;
   5. Temporary compensation concurrently paid if the participant dies or suffers from total permanent disability due to work accident or occupational disease;
   6. Rehabilitation costs, in the form of orthose and/or prothese;
   7. Denture reimbursement; and/or
   8. Scholarships for each child ofthe deceased or those suffered from total permanent disability in which such casualty or disability is due to a work accident.

Annex III Regulation of Government states that manpower that experiences a work accident or occupational disease, is entitled to receive accident insurance benefits:

1. Anatomical partial disability
   Disability compensation includes % referring to the table of partial permanent disability and other disability percentage x 80 x monthly wage
2. Functional partial disability
   Disability compensation includes % of the functional decrease x % referring to the table of the partial permanent disability and other disability percentage x 80 x monthly wage
3. Permanent total disability
   Disability compensation includes 70 % x 80 x monthly wage.

Annex III also contains the percentage of partial disability and other disability.

3.2.3 Regulation of Minister of Manpower of The Republic of Indonesia Number 10 of 2016

This regulation is concerned with the mechanism of Return to Work Program, as well as promotional activities and preventive actions to occupational accident and disease.

Workers suffering from occupational accident may be entitled to return to work program. Article 5 states that those who want to get Return to Work Program benefitsshould fulfill the following requirements:

a. Registered as BPJS Employment and Participant in JKK program;
b. Employer is paying contribution orderly;
c. Suffering from occupational accident or occupational disease resulting in disability;
d. Recommendation by Counsel Doctor that the worker shall be facilitated in Return to Work Program; and
e. Employer and Worker are willing to sign agreement letter to participate in Return to Work Program.

3.3 Implementation of Return To Work Program in Indonesia

The RTW program in Indonesia began in 2014, as the development of the benefits of accident insurance.The disabled worker suffering from occupational accident may be the participant of RTW program by following the steps:employer shall be required to report occupational accident and/or occupational disease as stage 1 report to BPJS Employment and the local agency administering governmental affairs in employment within 2 x 24 hours since the occurrence of occupational accident by using form as determined; BPJS Employment Case Manager shall conduct verification in order to consider the granting of Return to Work Program; Based on the verification result and supportingdocumentations from BPJS Employment Case Manager, the Counsel Doctor shall provide the recommendation to the participant to participate in Return to Work Program. The detailed stages of the implementation of RTW program can be seen in Figure 1.

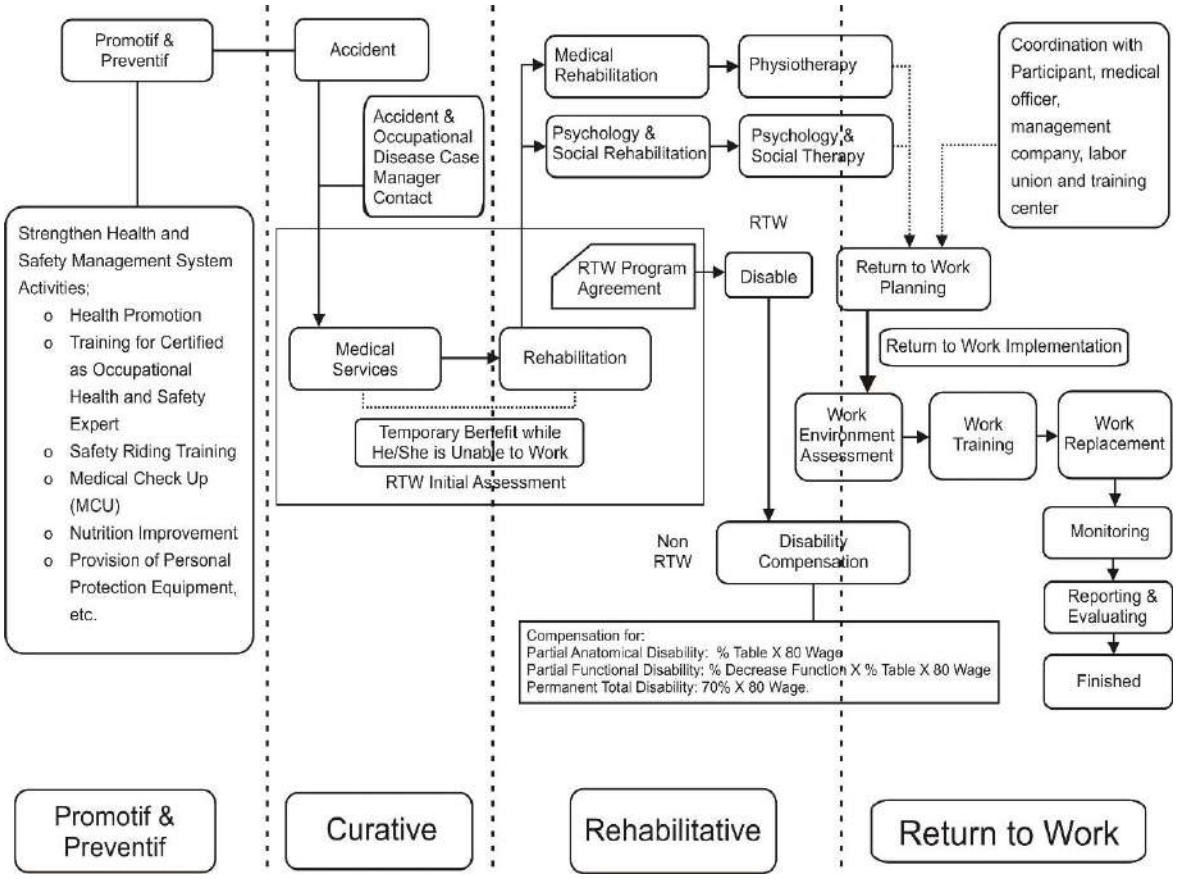

Figure 1. Flow Diagram of Return to Work Program Implementation
Source: BPJS Ketenagakerjaan

3.4 Discussion

3.4.1 Impact of Disability to Quality of Life of Worker

The decline in quality of life is a consequence of the occurrence of accidents that cause disability. Disability also causes work incapability or immobility (Murad, 2016). In addition, disability also influences the psychological condition (depression, suffering) (Mitchell, 2005) which results in decline iofincome/well-being (Üzümcüog˘lu, 2016).The condition of people with physical disability makes it difficult for them to work. These conditions affect their psyche that they tend to feel inferior, have lack of confidence, consider themselves less fortunate, have no potential, cannot live independently, and feel that they are not able to achieve what they aspire to in the future (Hurlock, 2004).

Disability also causes various health problems (Hou, 2013). Gender, types of disability, socio-economic status, wage/job satisfaction, interpersonal relationship, and self-esteem affectthe quality of life (Kwang Lee, 2016).

The Quality of life of disabled worker that initially declines may increase if social support is provided. The results of research conducted by Louis Leung and Paul S. N. Lee show that social support is the strongest determinant of quality of life (Leung, 2005). Social support makes people with disability able to accept reality, rise up, increase confidence and have the confidence to re-social, work, develop potential and establish self-reliance (Winasti, 2012).

The RTW program is a form of social support that directly affects material well-being, social well-being, and productivity well-being. That is, through the RTW program, workers with disability can return to work and have income to support their lives and their families'. The worker will feel hopeful, meaningful, and beneficial to the family. This condition also has a direct impact on his/ her physical and emotional well-being.

3.4.2 Challenges to Improve the Quality of Life of Workers with Disability through Multi-Sector Collaboration.

Blackhurst & Berdine (Sutatminingsih, 2002) said that disabled person is those whose physical or health problems result in an impairment of normal interaction with society to the extent that specialized services and programs are required. The RTW program is a specialized program for workers with disability suffering from occupational accident.

Before the RTW program is established, workers with disability suffering from occupational accidents have risk to lose their jobs and income. Since the RTW program is enacted, there is hope for them to work again. Workers with disability can be RTW program participants by following certain requirements. Not all of them can be RTW program participants because not all of themfulfill these requirements. Not all RTW program participants have returned to work. The number of RTW participants who has returned to work can be seen in Table 3.1.

Table 3.1. Data of RTW program participants.

Year	RTW Program Participants	RTW Program Participants who Have Returned to Work
2015	125	21
2016	304	182
2017	494	379
TOTAL	923	582

Sumber: BPJS Ketenagakerjaan, 2017

The number of RTW program participants and RTW program participants who have returned to work increases since 2015. Based on Table 3.1,we can see that there are 341 RTW program participants who have not returned to work. To show the objectives of the RTW program, the government has established cross-sectoral cooperation. The government institutions (Ministry of Health, Ministry of Manpower, dan Ministry of social affairs), along with the companies and training centers have been cooperating in realizing this program through a multisector collaboration.

Efforts that can help RTW program participants immediately to workinclude:

a. Training according to type and degree of disability, by adjusting ability, talents and interests.
b. Empowerment program by providing entrepreneurial/ self-employment training so RTW program participants are not dependent on formal sector industry.

The next challenge, which is the efforts to increase the number of companies that receive RTW participants and the number of acceptable participants in one company include:

a. Socialization of RTW programs in industry both formal and informal sectors.
b. Developing a workplace concept and a work environment conducive to workers with disability, so that the company can provide accessible facilities/ workplaces for workers with disability.

4. CONCLUSION

The RTW program is a benefit enlargement of accident insurance in Indonesia. Workers with disability due to occupational injuries are eligible to become RTW program participants. The purpose of the RTW program is to reduce the degree of disability, to enable participants to return to work and communities that directly improve the quality of life of RTW participants. Implementation of the RTW program is conducted through collaboration between government (Regional Office of Manpower, Regional office of health, Regional office of social), formal and informal industries, training centers and disability organizations. The return to work program was adequate to improve the quality of the life of workers with disability.

REFERENCES

Agovino, M. andParodi, G., "Identifying the Quality of Work by Fuzzy Sets Theory: A Comparison Between Disabled and Non-disabled Workers", *Social Indicators Research,* vol.119, no.3, pp.1627-1648, 2014.

BPJS Ketenagakerjaan, 2015

Bratsberg, B., et.al, "Job loss and disability insurance", *Labour Economic* 2013;no.24,pp.137-150, 2013

Brown, R. I., "Quality of life for people with disability models, research and practise", United Kingdom, Stanley Thornes, 1997.

Hou,W. H., et.al, "Return to work and quality of life in workers with traumatic limb injuries: A 2-Year Repeated-Measurements", *Archives of Physical Medicine and Rehabilitation,*vol.94, no.4, pp.703-710, 2013.

Hurlock, E., "PsikologiPerkembangan [alih bahasa]". Jakarta (ID): Erlangga Press; 2004.

Kitis, A., et al, "Investigation of disability level, leisure satisfaction, and quality of life in disabled employees", *Social Work in Public Health*, vol.32, no.2, pp.94-101, 2017.

Kwang Lee, Young and Gu Jie, Eun, "A study on factors influencing the quality of life of workers with disability", *Advanced Science and Technology Letters*, vol.131, pp.55-59, 2016.

Leung, L. and Lee, Paul S. N., "Multiple determinants of life quality: The rolesof internet activities, use of new media, social support, and leisure activities" *Telematics and Informatics,*vol.22, no.3, pp.161–180, 2005.

Mitchell, A. J., et al., "Quality of life and its assessment in multiple sclerosis: integrating physical and psychological components of wellbeing", *The Lancet Neurology*, vol.4, pp.56-66, 2005.

Murad, M. S., et al, "Impact of occupationally based intervention program in relation to quality of life of spinal injury people", *Procedia-Social and Behavioral Sciences*, no.222 pp.442-449, 2016.
Costanza, R., et al, "An integrative approach to quality of life measurement, research, and policy", *Surveys and Perspectives Integrating Environment and Society*, vol.1, no.1, 2008.

Republik Indonesia, "Law number 13 of 2003 concerning manpower", 2003.

Ruffing,K. A., “Socialsecuritydisabilityinsuranceisvital to workers with severe impairmentsprogram’s growth largely due to demographic factors;financing should be addressed as part of overall solvency”, *Center on budget policy priorities*, 2012.

Santana, V. S., et al., “Occupational accident : Social insurance costs and work days lost”, *Rev saude publica,* vol.40, no.6, pp.1-10, 2006.

Susniene, Dalia and Jurkauskas, Algirdas, “The concepts of quality of life and happiness – correlation and differences”, *InzinerineEkonomika-Engineering Economics*, vol.3, pp.58-66, 2009.

Sutatminingsih, R., “Pengaruh terapi realitas secara kelompok terhadap peningkatan konsep diri pada penyandang disabilitas fisik usia dewasa awal [master's thesis]”. Yogyakarta, ID: Universitas Gadjah Mada; 2002. [cited 2017Oct14]. Available from: http://repository.usu.ac.idJbitsreamll 23456789/7152/1 /d030025 8.pdf

Üzümcüog˘lu, Y., et al, “Life quality and rehabilitation after a road traffic crash: Aliterature review”, *Transportation Research Part F: Traffic Psychology and Behaviour,* no.40, pp.1-13, 2016.

Winasti, M., “Motivasi berwirausaha pada penyandang disabilitas fisik”, *Empathy*, vol.1, no.1, pp.177-187, 2012.

The Influence of Spatial Distribution of Social Environmental Factors on the Incidence of Dengue Hemorrhagic Fever (DHF) in Limboto District

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Article histori

Keyword:

Dengue Hemorrhagic Fever,
Mosquito Eradication,
Insect Replant ,
Waste Treatment.

ABSTRACT

DHF has become public health problem for the last 45 years. Since 1968 it has spread to 33 provinces and 436 districts out of 497 districts (88%). The mortality rate of DHF is categorized high if the CFR is more than 2%. In 2014 there were five provinces that have high DHF mortality rate that includes Bengkulu, Bangka Belitung, South Kalimantan, Gorontalo and Maluku. DHF in Gorontalo has become endemic diseases with reported deaths every year. DHF has been declared as extraordinary event in Gorontalo and as consequence the situation is on full allert. From January to December 2016there were789 cases of DHF in Gorontalo. The objective of this study to determine the spatial distribution of social environmental factors that influence the incidence of dengue hemorrhagic fever in Limboto Gorontalo. This is a descriptive research using geographic information system (GIS) to describe the spatial and incidence of dengue hemorrhagic fever (DHF). According to the survey conducted on 40 respondents, there were 23 respondents (57.50%) who performed mosquito eradication activities and 17 respondents (42.50%) who did not. Thirty respondents used mosquito repellent and 10 respondents did not. As for waste processing, there were 21 respondents who did waste processing and 19 respondents who did not. The map showed a relationship between mosquito eradication activities, the use of repellent and waste treatment with the incidence of dengue hemorrhagic fever. In conclusion, there is a spatial relationship between social environmental factors and the incidence of DHF in the district of Limboto. The variables include mosquito eradication activities, the use of mosquito repellent, and waste treatment.

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1. INTRODUCTION

Dengue hemorrhagic fever (DHF) is a disease transmitted through the bite of Aedes mosquitoes and is found in tropical-subtropical climates. Indonesia is a country located in the tropical area, so it is an area of deployment leading to high morbidity in Indonesia (Depkes, 2005).

Diseases caused by Dengue virus still remain a public health problem to date. Although the mortality rate tends to decrease, the morbidity rate continues to increase. In 2007, the number of dengue cases in Indonesia was 156,767 with 1,570 deaths. In 2008, there were 136,339 cases with 1,170 deaths. The highest incidence rate (IR) was found in DKI Jakarta (317.09 per 1,000,000 population) and the lowest one was in Maluku Province (0.00 per 100,000 population) (Sudjan, 2010).

Mortality caused by DHF is categorized high if the CFR is more than 2%. Therefore, there were 5 provinces that were categorized with high CFR in 2014, including Bengkulu, Bangka Belitung Archipelago, South Borneo, Gorontalo and Maluku. DHF in Gorontalo District has become an endemic disease every year with many reported deaths. DHF in Gorontalo is categorized to be on vigilant level. Incidence of DHF has been declared as extraordinary circumstances. From January to December 2016, there were 789 reported cases of DHF in Gorontalo.

DHF incidence in Gorontalo District from 2010 to 2015 tends to fluctuate. One of the factors that influence the occurrence of DHF is the weather. Weather factors, such as precipitation, air temperature, humidity and wind speed were analyzed spatially with ecological study approach. It was indicated that there was a significant relationship between weather factors with DHF incidence in Gorontalo regency from 2010 to2015 (Pakaya, 2016).

Limboto sub-district is the center of Gorontalo regency city which is experiencing a quite rapid growth in various fields, such as agriculture, economy, and population mobility. In a study conducted by Pakaya in 2017, dengue fever incidence in Limboto district from2012 to 2015 has increased and weather factors are among the factors that influence the incidence of DHF (Pakaya, 2017).The objective of this study to determine the spatial distribution of social environmental factors influencing the incidence of dengue hemorrhagic fever in Limboto district, Gorontalo Regency.

Ministry of Health develops DHF prevention method to change the community behavior by involving community participation in eradicating mosquito nests by family or society on a regular, simultaneous and continuous basis. Dengue eradication efforts focus on mobilizing the potential of the community to participate in the eradication of mosquito (3M plus movement), *Jumantik* (members of the community who voluntarily monitor the presence of Aedes aegypti mosquito larvae in their environment) to monitor the larvae free index, as well as introducing dengue symptoms and ways to handle them at home. The appropriate method for preventing DHF is PSN through 3M plus (Drain, Close and Bury) as well as sowing larvicide, fish dispersion at water reservoirs, and other activities that can prevent Aedes aegypti mosquitoes from breeding (Depkes RI, 2007).

2. RESEARCH METHOD

a. Type and research design

This research is descriptive research, which is a study to provide description of a situation objectively.This study used geographic information system (GIS) to describe the spatial and the incidence of dengue hemorrhagic fever (DHF) in Limboto district, Gorontalo Regency. This study took the coordinate point of every house with DHF patients. The variables in this study were mosquito eradication action, insect repellant and waste treatment. The population in this study was all cases of Dengue Hemorrhagic Fever in Limboto District in 2015 with 40 cases as the sample of the research.

b. Study Area

Limboto district is one of 19 Districts on Gorontalo regency. This district on sists of 12 villages. Limboto District is 130.5km^2 or equal to 5.91%of the total area of Gorontalo Regency. The widest village is Polohungo. Byseeing at the earth surface morphology, most of the area is low land area.

There is Telaga Biru on the east side of Limboto district, Limboto Barat on the west side, Gorontalo Utara Region on the north side, and the District of Tabongo and Lake Limboto on the south side (Badan Pusat Statistik, 2016).

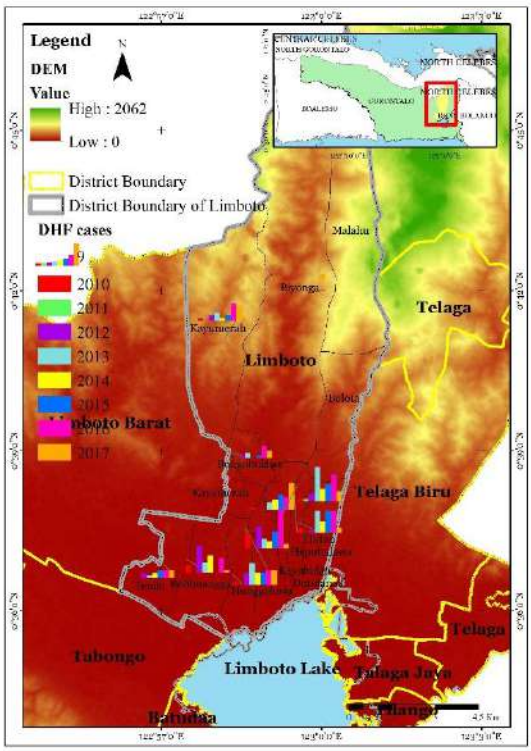

Figure1. Study Area of Limboto District and DHF Incidence from 2010 to 2017

c. Spatial Analysis

The Main Characteristics of Geographic Information Systems is the ability to analyze systems such as statistical analysis and overlay called spatial analysis. By using Geographic Information Systems that are often used in spatial crisis terms, unlike other information systems by adding 'space' or geography dimensions, we can describe the attributes of phenomena such as the age of a person, the type of road, etc. simultaneously with information such as where a person lives or the location of a road (Keele, 1997).Spatial analysis is done by overlaying two maps and producing a new map of the analysis (Tuman, 2001).

3. RESULTS AND ANALYSIS

Limboto District is the capital of Gorontalo Regency consisting of 12 villages. Limboto District is located at 0.30^{o} North Latitude, 1.0^{o} South Latitude, 121^{o} East Longitude and 123.3^{o} West Longitude. Limboto district is right next to Limboto Lake with an area of ± 3000 ha and an average depth of 5 to 8 meters. Limboto District has an area of 103.32 km2 with a population of 51.008 people (Badan Pusat Statistik, 2016).

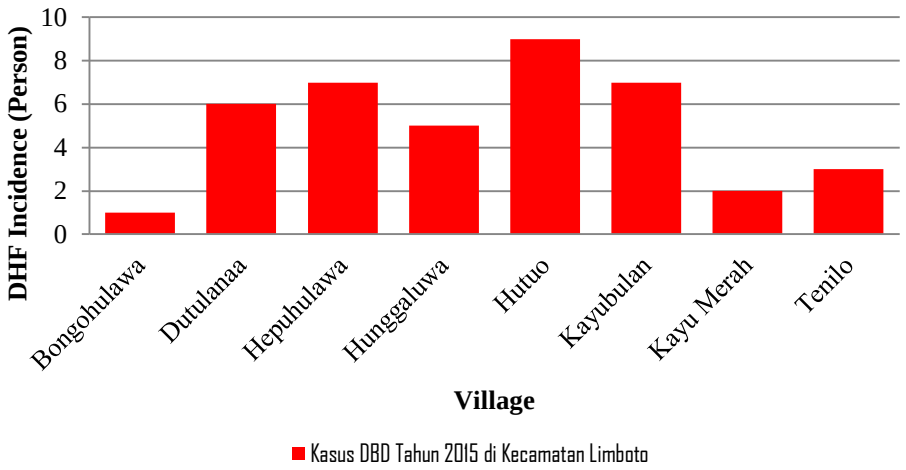

Figure 2. Distribution of DHF Incidence in Limboto by Village in 2015

The total number of DHF Incidence in Limboto District in 2015 was 40 with 2 deaths from 12 villages in Limboto district. Among all villages, 8 villages were endemic to DHF disease (Figure 2). An area is said to be endemic when there were cases of DHF in the last 3 years.

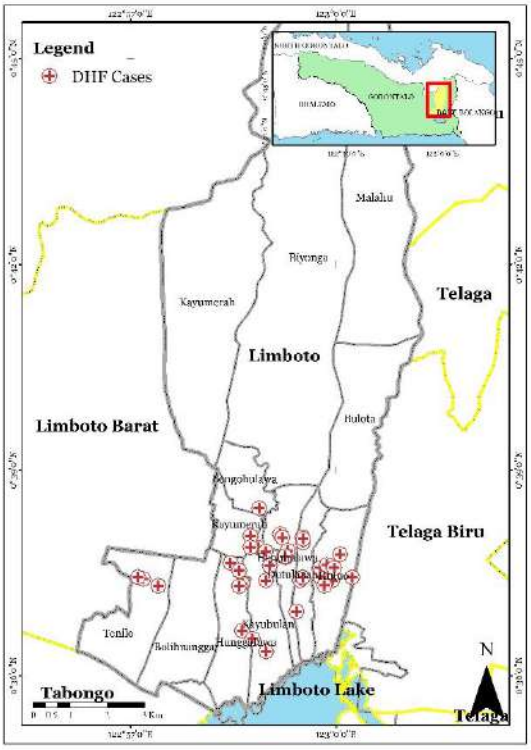

Figure 3. Distribution Map of DHF Incidence in Limboto district, Gorontaloin 2015

a. Description of Mosquito Eradication in Limboto District in 2015

Mosquito eradication activities are efforts made to cut the chain of the development of *Ae. aegypty*vector. Environmental management through eradication of mosquito breeding aims to prevent

disease transmission by reducing vector breeding. It aims to avoid direct contact of mosquito vector with humans. The mosquito eradication activities are carried out by draining water reservoirs, burying used goods and other garbage that can accommodate rainwater so that mosquitoes can breed in it. The description of Mosquito Eradication activities in Limboto District, Gorontalo Regency is presented in Table 1:

Table1. Description of Mosquito Eradication Activities in DHF Patients' House in Limboto in 2015

Mosquito Eradication Activities	Number of House(s)	Percentage (%)
Yes	23	57,50
No	17	42,50
Total	40	100

Based on a survey conducted on 40 respondents, there were 17 respondents (42.50%) who did not carry out mosquito eradication actions and there were 23 respondents (57.50%) who conducted the mosquito eradication actions. The distribution of Mosquito eradication activities is shown in Figure 4.

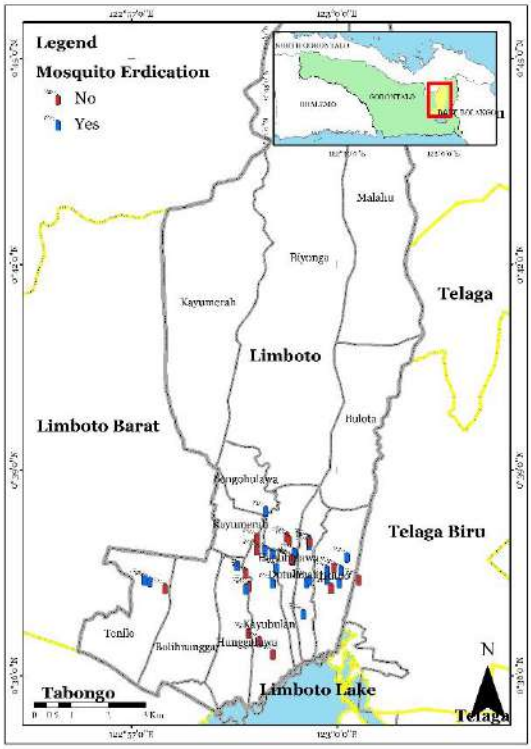

Figure 4. Distribution Map of Mosquito Eradication Activities in Limboto district, Gorontalo in 2015

The implementation of mosquito eradication activities gave a significant influence on the presence of larvae. It can be concluded that active participation in mosquito eradication activities can reduce the presence of mosquito larvae. Mosquito eradication efforts should also be supported by all family members, since the execution is done outside and inside the house in a balanced manner so that the existence of mosquito larva can be avoided (Setyobudi, 2011).

b. Description of Insect Repellant in Limboto District in 2015

One method of preventing individuals or groups from direct contact with mosquito bites is by using mosquito repellant (Lawuyan, 2006). The description of the use of insect repellant in Limboto District, Gorontalo Regency is presented in Table 2:

Table 2. Description of the Use of Insect Repellant in DHF Patients' House in Limboto in 2015

Using Insect Replant	House	Percentage (%)
Yes	30	75
No	10	25
Total	40	100

Based on a survey conducted on 40 respondents, there were 10 respondents (25%) who did not use anti-mosquito repellant and there were 30 respondents (75%) who used anti-mosquito repellant as a protection from mosquito bites. The distribution map of the use of Mosquito Replant is shown in Figure 5.

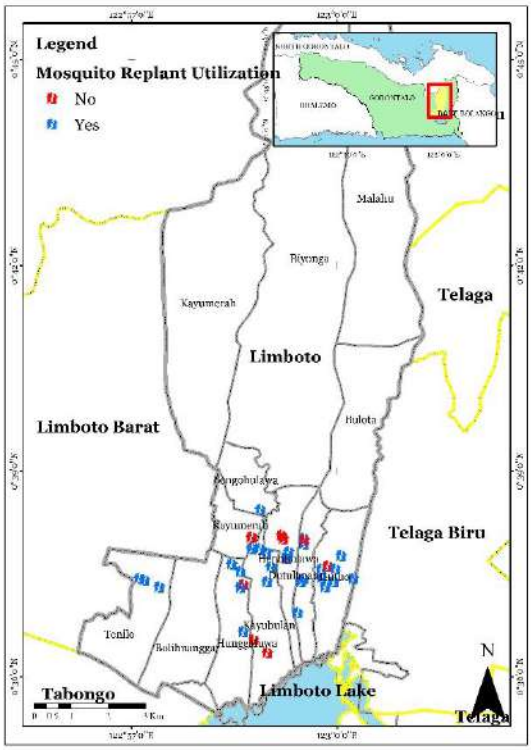

Figure 5. Distribution Map of the Use of Mosquito Repellant in Limboto district, Gorontalo in 2015

Mosquito repellant is one of the efforts made to protect ourselves from mosquito bites. Mosquito repellant are used to repel mosquitoes. It can be in the forms of insecticide-treated mosquito nets, as well as electric and spray mosquito repellant. The use of mosquito repellant, especially in the morning and evening, can reduce the contact between human and mosquito *Ae. aegepty* mosquitoes normally start biting in the morning and evening at 09:00 to 10:00 am and 04.00 to 05.00 p.m (Sigit, 2006).

However, the use of anti-mosquito drugs such as spray, electric and fuel must also be in accordance with the dosage and instructions on the label so as not to pose a danger to ourselves. Anti-mosquito repellant can be used indoors or outdoors. In order to get effective results indoors, it is

advisable to close the room within sufficient time (approximately 15 minutes) after applying the repellant so that the insecticide and insect contact is optimum (Sigit, 2006).

c. Description of Waste Management in Limboto District in 2015

The most effective mosquito vector control measures are waste and environmental management by applying the basic rules of "reduce, reuse and recycle". Plastic containers that can act as potential larvae habitats can effectively be recycled. The description of Waste Management in Limboto District, Gorontalo Regency is presented in Table 3.

Table 2. Description of Waste Management in DHF Patients' House in Limboto in 2015

Waste Management	House	Percentage (%)
Yes	21	52,50
No	19	47,50
Total	40	100

Based on survey conducted on 40 respondents, there were 21 respondents (52,50%) who carried out waste management and there were 19 respondents (47,50%) who did not carry out waste management. The distribution map of Waste Management is shown in Figure 6.

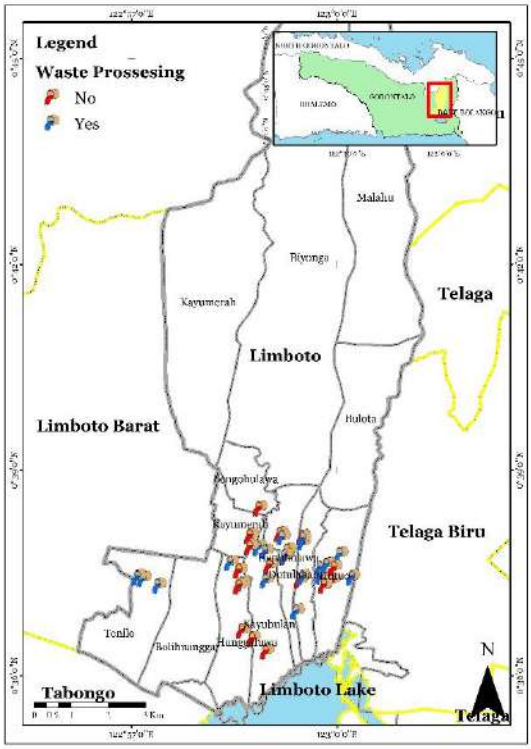

Figure 6. Distribution Map of Waste Treatment in Limboto District, Gorontalo 2015

According to WHO (1999), vector control efforts should encourage effective waste management and attention to the environment by improving the basic rules of reducing, reusing and recycling (WHO, 1999).

Solid, dry waste such as cans, bucket bottles and the like that are scattered around the house must be removed and buried in the ground. The remaining material in the factory and the warehouse should be treated as good as possible before being destroyed. Home appliances and plantation tools

(buckets, bowls and sprinklers) should be kept upside down to prevent rainwater from collecting. Plant waste (coconut shell) should be destroyed immediately. Used car tires are the main breeding ground for Aedes aegypti in urban areas, thus becoming a health problem. Bottles, glass, cans and other small containers should be buried in the ground or destroyed and recycled for industrial use (Sudjan, 2010).

4. CONCLUSION

Description of social environment in Limboto district, Gorontalo regency in 2015 showed that from the 40 respondents, there were 23 respondents (57.50%) who did Mosquito Eradication activities, 30 respondents (75%) who used mosquito repellant and 21 respondents (52.50%) who carried out waste treatment. This study only describes the incidence of dengue hemorrhagic fever with social factors namely mosquito eradication actions, the use of anti-mosquito repellant, and waste management, which is performed by using the Map.

ACKNOWLEDGEMENTS

The author disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was supported by Public Health Faculty, Universitas Gorontalo and Duluwo Limo Lo Pohalaa Gorontalo foundation. I am very grateful to have Mr. Muhammad Ramdhan Olii as the reviewer who put invaluable comments, which were very helpful for the improvement my articles.

REFERENCES

Badan Pusat Statistik. Kabupaetn Gorontalo dalam Angka. Gorontalo. 2016

Departmen Kesehatan RI. Tata Laksana DBD, Jakarta: Dep Kes RI. 2005

Departemen Kesehatan RI. *Profil Kesehatan Indonesia 2005.* Jakarta: Departemen Kesehatan RI. 2007

Keele,. ,"An Introduction to GIS using ArcView : Tutorial",Issue 1,Spring 1997 based on Arcview release 3, http://www.keele.ac.uk/depts/cc/helpdesk/arcview/av_prfc.htm, 1997.

Lawuyan, S.J.,.Pembasmian Penyakit Demam Berdarah Dengue Kontroversi Program Pengasapan dengan Insektisida. Litbang.depkes.http://www.litbang.depkes.go.id. 2006

Pakaya R. Analisis Spasial dan Faktor Lingkungan yang Mempengaruhi Kejadian Demam Berdarah Dengue (DBD) di Kecamatan Limboto Kabupaten Gorontalo Tahun 2010-2015. 2016;

Pakaya R. Spatial Analysis And Environmental Factors Associated Against Case Of Dengue Hemorrhagic Fever (DHF) In Limboto District 2012-2015, Gorontalo. 2017;45–55.

Setyobudi, A.,. Faktor-faktor yang Berhubungan Dengan Keberadaan Jentik Nyamuk di Daerah Endemik DBD di Kelurahan Sananwetan Kecamatan Sananwetan Kota Blitar. *Prosiding Seminar Nasional Peran Kesehatan Masyarakat dalam Pencapaian MDG's di Indonesia*.2011

Sigit, S. H. dan Hadi, U. K (Ed).*Hama Pemukiman Indonesia (Pengenalan, Biologi dan Pengendalian).* Unit Kajian Pengendalian Hama Pemukiman, Fakultas Kedokteran Hewan IPB, Bogor.2006.

Sudjan, P. Diagnosis Dini Penderita Demam Berdarah Dengue Dewasa. Buletin Jendela Epidemiologi. 2010; Vol. 2:21

Tuman,. "Overview of GIS",. http://www.gisdevelopment.net/tutorial/tuman006.htm. 2001

WHO. *Demam Berdarah Dengue Diagnosis, Pengobatan, Pencegahan, Dan Pengendalian*. Jakarta:EGC.1999

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Factors Influencing Knowledge, Practice, and Behavior of Household Waste Management Among Riverside Communities

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Article Info

Keyword:

Knowledge,
Practice,
Behavior,
Waste management,
Riverside communities.

ABSTRACT

Littering is one of the maincause of environmental pollution and health problems. Household waste management and disposal is an important issue in the Municipality of Banjarmasin. The purpose of this study was to identify the relationship between socio economic and demographic factors and family members' knowledge, practice, and behavior on waste management in order to develop corrective action plans. This study uses cross-sectional design and multistage random for its sampling method. We found that education level, household income, and sex were independently linked to littering. We also found that communities have insufficient knowledge, reckless practices, and risky behaviors in regards to waste management. Promotion of environmental information and public education on proper waste disposal will improve communities' health and safety.

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1. INTRODUCTION

Human life is constantly evolving and cutting-edge products are constantly produced to meet the most basic needs of life. However, the production and consumption of the resulting resources end with an important issue related to waste management in different parts of the world. Often, the waste of the production or the leftover resources that are not used will end up become garbage that pollutes the environment (Adogu,2015)(Zagozewski, 2011). Environmental pollution associated with littering has a serious negative impact on the health and safety of the people (Giusti, L., 2009)(Sankoh, 2013).To prevent environmental pollution due to improper waste handling, some appropriate steps are required. Garbage must be sorted by types, whether organic or non-organic. There is also a need to apply sanitary landfill techniques or incineration techniques for waste that cannot be decomposed easily (Ahsan, 2014). Inadequate waste management can be attributed to many factors, but it is important to emphasize the role, attitude, the practice of community waste management, and their interaction with other factors in the waste management system. Society is the ultimate end user (Mukarna, 2016)(Malik, 2015).

Safe management and disposal of household waste was a problem faced by the people living in Banjarmasin city, Indonesia. Banjarmasin city has a main landfill with an area of about 39.46 hectares. In addition the local government has provided temporary dump or trashbin for the community, but there are still many people who throw garbage into the river or open land (Rahmaddin, 2015). Barriers to waste management in the city of Banjarmasin may be quite unique in terms of environmental impacts, socioeconomic factors, and cultural heritage. Thus, different areas will find different effective strategies for proper waste management. Some studies have found that good safety awareness at home (Okechukwu, 202) or knowledge (Banga, 2011) about waste related to adverse health effects are associated with

household waste disposal strategies. For example, safety behavior is required to prevent direct contamination and exposure of infectious and harmful substances to health from household waste. On the other hand, increasing knowledge can encourage positive attitudes and build safe practices in society. In Banjarmasin, there is a shortage of measures aimed at informing the public about the causal relationship between environmental pollution and health, and there is not any long-term evaluation provision. Therefore, research and development of waste management should continue to develop data, models, and concepts related to long-term waste disposal. The main objectives of the study were (1) to identify factors related to inappropriate household waste disposal and (2) to assess household knowledge about health and safety risks posed by inappropriate household waste disposal.

2. RESEARCH METHOD

2.1 Study Population

Banjarmasin city is the largest city in South Kalimantan Province. The city was estimated to contain more than one-third of the population in South Kalimantan Province. Banjarmasin dubbed the City of Thousand River has an area of 98.46 km² whose territory is an archipelago consisting of about 25 small islands. Based on BPS data of Banjarmasin City in 2016, Banjarmasin has a population of 675,440 people with a density of 9,381 people per km². South Kalimantan Province has a population of about 1.9 million people (BPS Kota Banjarmasin, 2016)(Wikipedia, 2017).

2.2 Study Design and Study Sample

This study uses cross-sectional design. Sampling was done by using multistage random sampling method. The main sampling unit was households located on the outskirts of the Martapura River in Central Banjarmasin Sub-District, Banjarmasin City. This sub-district was chosen because Martapura River is located almost along this Sub-District, so that there are many houses on the river bank in this Sub-District. The secondary sampling unit consists of random sub-sampling in the reporting unit to obtain a household sample according to the household list established by the study team leader and the community representative. The tertiary sampling unit was a single member per household, preferably head of household. Based on the response rate by prospective participants, a sample of 784 participants was obtained.

The study was conducted between March and June 2017. As a part of the inclusion criteria, the participants must be eligible (1) be at least 18 years of age, (2) agree to participate in the study, (3) be able to speak Banjar language or at least Bahasa language, and (4) not suffering from mental disorders or central nervous system disorders (including behavioral disorders).

2.3 Data Collection

To improve community responses, community leaders were asked to help recruit data collectors from the community. Data collectors were a combination of University Students and Senior High School Students. Interviewers were trained intensively with regard to study procedures and questionnaires. Data collectors were also specially trained to ensure that prospective participants were fully informed of their rights before getting approval. The questionnaire contains detailed information about the participants regarding waste disposal practices. This study also asks about knowledge and safety behavior related to household waste management. The questionnaire was made by researchers after a literature search on related topics (Aroj, 2004). Prior to the study, the validity and reliability of the questionnaire were tested.

In this study, three variables were used to represent the outcome measure: waste disposal practices, knowledge about the negative impacts of littering household waste, and safety behavior associated with waste management. The community waste disposal practice comes from the question: "How do you usually get rid of trash?" This question consists of four values: dumped into a temporary dump/landfill, dumped into a river, dumped into an open land, or burned. These four values were further dichotomized into good waste disposal practices when people dump trash directly into a temporary dump/landfill, or inappropriate waste disposal practices, when waste is discharged into rivers, open land, or burned. The level of knowledge was considered "lacking" with a score <50% and rated "good" with a score of ≥ 50%. The level of safety behavior was considered "safe" for those whose score > mean and considered "unsafe" for those with a score ≤ mean.

2.4 Data Analysis

Descriptive analysis was conducted to investigate the characteristics of waste disposal practices in the study population. Multivariate analysis of binary logistic regression was conducted to examine the influence of socioeconomic and demographic factors on the practice of community waste disposal, the level of public knowledge about the causes of diseases related to inappropriate waste management, and safety behavior related to waste management. To prevent the possibility that participants will apply good waste disposal practices during the study, the other six variables will be explained: age, sex, marital status, education level, household income, and distance to a temporary dump/landfill. To predict participants' knowledge of the causes of disease from waste management, five predictors were used in this model: age, sex, marital status, education level, and household income. (Mukarna, 2016, Addo, 2017). For the questionnaire component, items and reliability were applied. Statistical significance was set at ≤ 0.05.

3. RESULTS AND ANALYSIS

3.1 Results

Table 1 illustrates the frequency distribution of socioeconomic and demographic characteristics. There was a total of 784 participants. The mean age (± standard deviation) was 41.6 ± 16.2 years, corresponding to the age range from 18 to 66 years. The average household income of participants was IDR 2,645,000 (SD ± 1,925,000). Table 1 also identifies 4 methods of waste disposal. Most of the waste was discharged into the river (47.3%), disposed by burning (18.1%), dumped into a temporary dump/landfill (20.2%), and disposed to an open land (15.3%).

Table 1. Socioeconomic and demographic characteristics and methods of waste disposal of participants (N = 784)

Variable	Frequency (%)	Methods of waste disposal			
		A temporary dump/landfill N (%)	Dumped into a river N (%)	Dumped into an open land N (%)	Burned N (%)
Overall	784 (100%)	139 (17.7%)	371 (47.3%)	132 (15.3%)	142 (18.1%)
Age					
18-35	289 (36.8%)	28 (9.7%)	184 (63.7%)	35 (12.1%)	42 (13.8%)
36-40	273 (34.8%)	32 (11.7%)	150 (54.9%)	50 (18.3%)	41 (15.0%)
41-60	184 (23.5%)	59 (32.0%)	30 (16.3%)	45 (24.5%)	50 (27.2%)
≥60	38 (4.8%)	20 (52.6%)	7 (18.4%)	2 (5.3%)	9 (23.7%)
Sex					
Male	328 (41.8%)	85 (25.9%)	128 (39.0%)	40 (12.2%)	75 (22.9%)
Female	456 (58.2%)	54 (11.8%)	243 (53.3%)	92 (20.2%)	67 (14.7%)
Marital status					
Single	153 (19.5%)	27 (17.6%)	53 (34.6%)	36 (23.5%)	37 (24.2%)
Married	452 (57.6%)	63 (13.9%)	272 (60.2%)	51 (11.3%)	66 (14.6%)
Divorce	66 (8.4%)	17 (25.8%)	16 (24.2%)	20 (30.3%)	13 (19.7%)
Widow/widower	113 (14.4%)	32 (28.3%)	30 (26.5%)	25 (22.1%)	26 (23.0%)
Education level					
Elementary School	225 (28.7%)	8 (3.6%)	160 (71.1%)	33 (14.7%)	24 (10.6%)
Middle School	280 (35.7%)	10 (3.6%)	150 (53.6%)	63 (22.5%)	57 (20.4%)
Senior High School	208 (26.5%)	74 (35.6%)	46 (22.1%)	30 (14.4%)	58 (27.9%)
College	71 (9.1%)	47 (66.2%)	15 (21.1%)	6 (8.5%)	3 (4.2%)
Household income (IDR)					
< 2.285.000	504 (64.3%)	22 (4.4%)	283 (56.2%)	94 (18.7%)	105 (20.8%)
≥2.285.000	280 (35.7%)	117 (41.8%)	88 (31.4%)	24 (8.6%)	51 (18.2%)
Distance to a temporary dump/landfill					
< 50 meters	80 (10.2%)	38 (47.5%)	11 (13.8%)	17 (21.3%)	14 (17.5%)
50-100 meters	153 (19.5%)	63 (41.2%)	24 (15.7%)	30 (19.6%)	36 (23.5%)
101-200 meters	356 (45.4%)	23 (6.5%)	184 (51.7%)	65 (18.3%)	84 (23.6%)
> 200 meters	195 (24.9%)	15 (7.7%)	152 (77.9%)	20 (10.3%)	8 (4.1%)

Note: IDR: Indonesian Rupiah

When analyzing waste disposal methods on socioeconomic and demographic aspects, we can quickly identify that participants in the 18-35 years age group often dumped garbage in rivers (63.7%) or by burning (13.8%). Participants aged 36-40 often threw their garbage into the river (54.9%) or disposed the waste by burning (15.0%). The most common method of waste disposal of participants in the 41-60 years age group was discharging it to a temporary dump/landfill (32.0%) or by burning (27.2%), whereas for the age group of over ≥ 60 years, the most common method was disposing of waste into a temporary dump/landfill (52.6%) and burning (23.7%). Most of the women (53.3%) dumped more waste into rivers than men (39.0%). Participants with elementary school education (71.1%) and those with middle school education (53.6%) often dumped garbage into rivers, while participants with senior school high school (35.6%) education and college background (66,2%) often threw garbage into a temporary dump/landfill. Participants who earned<IDR 2,285,000 (56.2%) often threw garbage into rivers, whereas participants with income ≥ IDR 2,285,000 (41.8%) often dumped garbage into a temporary dump/landfill. Participants who lived less than 50 meters (47.5%) or between 50 to 100 meters (41.2%) often dumped trash into a temporary dump/landfill, but participants living between 101 to 200 meters and over 200 meters of a temporary dump/landfill, respectively, dumped their waste into rivers (51.7% versus 77.9%).

Table 2.Knowledge of health impact and participants' behavior related to waste management (N = 784)

Questions about correct response	N (%) Correct response
Knowledge	
Does inappropriate waste disposal dangerous? (Yes)	726(92.6%)
Can surface water/groundwater/tap water be contaminated at any time? (Yes)	299 (38.1%)
Does child's feces is as dangerous as that of an adult? (Yes)	321 (40.9%)
Does the following illness related to inappropriate waste disposal?	
Cholera (Yes)	463 (59.1%)
Typhoid (Yes)	498 (63.5%)
Dysentery (Yes)	69 (8.8%)
Malaria (Yes)	441 (56.3%)
Diarrhea (Yes)	161 (20.5%)
Injury (Yes)	26 (3.3%)
Respiratory infection (Yes)	34 (4.3%)
Behavior	
Do your kids play near the garbage? (No)	166 (21.2%)
Do you buy food from the shops near the trash? (No)	477 (60.9%)
Do you wash your hands properly after taking out the trash? (Yes)	410 (52.3%)
Do you drink boiled water? (Yes)	585 (74.6%)
Do you produce waste every day? (Yes)	432 (55.1%)
Do you usually keep garbage near the outside door? (No)	456 (58.2%)
Do you leave unprotected garbage near the outside door? (No)	192 (24.5%)
Do you leave the waste container overflowing? (No)	326 (41.6%)
Do you wash the trash containers with soap and water or cleaners with dry soil or sand? (Yes)	111 (14.2%)
Do child feces removed with other household garbage? (No)	277 (35.3%)
Do you usually treat water from the unprotected and suspicious surface, soil, and pipelines before using it? (Yes)	115 (14.7%)
Do you sleep in a mosquito net? (Yes)	471 (60.1%)

Table 2 illustrates the knowledge of participants on the causes of diseases related to waste. Satisfactorily, 92.6% of participants were aware of the fact that improper handling of waste was harmful to human health. Unfortunately, 61.9% of participants were unaware of the possible contamination of hosts from surface, soil, and piped water at any time due to inappropriate waste management. Likewise, 59.1% of participants considered that improper disposal of children's feces did not have adverse health effects. Regarding participants' evaluation of their knowledge of diseases caused by inappropriate waste management, 59.1%, 63.5%, and 56.3% of participants were aware that, respectively, cholera, typhoid, and malaria could be attributable to improper waste management. However, few participants believed that diarrhea (20.5%), dysentery (8.8%), respiratory infections (4.3%), and injuries (3.3%) may be due to improper handling of waste.

Table 2 illustrates the safety behavior of participants in relation to waste management. Interestingly, 52.3% of participants adopted an important aspect of personal hygiene; they washed their

hands properly after garbage disposal. Importantly, 55.1%, 58.2%, and 60.1% of participants threw garbage every day, usually put rubbish near the outside door, and slept using a mosquito net. Another aspect of safety behavior remains a concern; participants did not prevent their children from playing near the garbage (78.8%), they left unprotected garbage near the outside door (75.5%), they did not often wash the trash can with soap or water or soak it with soil or dry sand (85.8%).

Table 3. Binary model logistic regression association between waste disposal methods, socioeconomic characteristics, and participant demographics (N = 784)

Variable	Good garbage disposal (a temporary dump/landfill) N (%)	Unadjusted		Adjusted	
		POR 95% CI	*p*-value	POR 95% CI	*p*-value
Age					
18-35	28 (9.7%)	2.43 (1.04-4.94)	0.05	0.80 (0.13-1.99)	0.01
36-40	32 (11.7%)	1.42 (0.50-3.20)	0.10	1.23 (0.53-3.65)	0.01
41-60	59 (32.0%)	5.65 (2.20-7.23)	0.00	1.57 (1.21-2.84)	0.00
≥60	20 (52.6%)	2.53 (0.53-3.40)	0.00	0.38 (0.10-2.80)	0.02
Sex					
Male	85 (25.9%)	2.60 (1.05-3.65)	0.00	1.43 (0.54-2.15)	0.04
Female	54 (11.8%)	1.90 (0.73-3.64)	0.02	2.60 (1.56-3.88)	0.00
Marital status					
Single	27 (17.6%)	2.45 (1.13-4.56)	0.04	1.12 (0.84-2.49)	0.00
Married	63 (13.9%)	2.10 (1.42-4.54)	0.25	0.84 (0.48-1.24)	0.00
Divorce	17 (25.8%)	2.79 (1.23-6.37)	0.30	1.45 (0.42-2.94)	0.03
Widow/widower	32 (28.3%)	3.40 (1.43-5.24)	0.00	0.71 (0.40-2.39)	0.01
Education level					
Elementary School	8 (3.6%)	2.90 (1.04-4.24)	0.00	3.42 (1.26-4.16)	0.01
Middle School	10 (3.6%)	3.34 (1.14-4.53)	0.00	2.12 (1.02-4.24)	0.00
Senior High School	74 (35.6%)	2.14 (1.02-3.59)	0.10	1.31 (0.58-3.95)	0.00
College	47 (66.2%)	2.43 (1.11-4.46)	0.40	2.21 (1.43-3.86)	0.00
Household income (IDR)					
< 2.285.000	22 (4.4%)	3.42 (1.33-4.56)	0.00	0.46 (0.02-0.85)	0.02
≥2.285.000	117 (41.8%)	2.30 (1.56-3.67)	0.00	0.10 (0.05-0.77)	0.02
Distance to a temporary dump/landfill					
< 50 meters	38 (47.5%)	1.15 (0.24-2.10)	0.02	0.65 (0.12-1.10)	0.00
50-100 meters	63 (41.2%)	0.58 (0.24-1.20)	0.01	0.23 (0.03-0.84)	0.03
101-200 meters	23 (6.5%)	1.53 (0.03-2.30)	0.20	0.10 (0.32-0.55)	0.01
> 200 meters	15 (7.7%)	2.32 (1.03-3.40)	0.00	0.25 (0.11-0.94)	0.01

p< 0.05 significant

Note: IDR: Indonesian Rupiah; POR: Prevalence Odds Ratio; CI: Confidence Interval

In Table 3, logistic regression model shows that variables such as sex, education level, marital status, household income, and the distance from landfills made an independent statistical contribution to the model. The strongest predictors and incorrect practices of garbage disposal were education level, and sex with POR of 3.42 and 2.60, respectively. POR for income indicates a slight change in the possibility of inappropriate waste disposal. People living 50 meters from a temporary dump/landfill tended to dump their waste there with a POR of 0.65 (Table 3).

Table 4. Binary model logistic regression associations between the participants' level of knowledge about the causes of diseases related to waste and the socioeconomic and demographic characteristics of the participants (N = 784)

Variable	Good knowledge N (%)	Unadjusted		Adjusted	
		POR 95% CI	*p*-value	POR 95% CI	*p*-value
Age					
18-35	89 (32.9%)	2.13 (1.17-3.43)	0.03	1.44 (0.29-2.48)	0.50
36-40	72 (26.7%)	1.38 (0.52-3.93)	0.02	1.73 (0.83-3.94)	0.08
41-60	91(33.7%)	1.13 (0.74-2.84)	0.01	0.85 (0.19-2.46)	0.10
≥60	18 (6.7%)	1.35 (0.85-2.38)	0.00	1.16 (0.43-3.48)	0.03
Sex					
Male	167 (61.9%)	1.53 (0.81-2.59)	0.25	0.25 (0.01-0.78)	0.00
Female	103 (38.1%)	0.88 (0.32-2.58)	0.01	0.56 (0.39-0.89)	0.01
Marital status					
Single	70 (25.9%)	1.24 (0.23-2.54)	0.00	2.04 (1.13-4.79)	0.01
Married	92 (34.1%)	1.02 (0.12-2.45)	0.00	1.25 (0.24-4.57)	0.20
Divorce	36 (13.3%)	1.94 (0.89-3.49)	0.20	2.03 (1.40-4.69)	0.10
Widow/widower	72 (26.7%)	2.53 (1.24-4.56)	0.00	1.39 (0.83-3.22)	0.35
Education level					
Elementary School	19 (7.0%)	1.26 (0.65-2.64)	0.01	0.81 (0.32-1.42)	0.04
Middle School	50 (18.5%)	2.08 (1.02-4.25)	0.10	0.32 (0.01-0.84)	0.01
Senior High School	136 (50.4%)	4.10 (2.33-7.88)	0.10	0.60 (0.13-1.12)	0.00
College	65 (24.1%)	1.43 (0.87-2.82)	0.00	1.10 (0.13-2.04)	0.02
Household income (IDR)					
< 2.285.000	82 (30.4%)	0.84 (0.52-1.42)	0.02	1.53 (0.77-3.41)	0.00
≥2.285.000	188 (69.6%)	0.41 (0.16-1.23)	0.01	3.80 (1.24-7.14)	0.01
Distance to a temporary dump/landfill					
< 50 meters	77 (28.5%)	1.64 (0.87-2.97)	0.10	1.34 (0.66-3.49)	0.10
50-100 meters	104 (38.5%)	1.22 (0.72-2.56)	0.00	2.80 (1.32-3.45)	0.00
101-200 meters	50 (18.5%)	1.48 (0.83-1.74)	0.40	1.20 (0.28-2.48)	0.06
> 200 meters	39 (14.4%)	0.64 (0.31-1.34)	0.50	1.12 (0.24-2.95)	0.25

p< 0.05 significant
Note: IDR: Indonesian Rupiah; POR: Prevalence Odds Ratio; CI: Confidence Interval

In Table 4, logistic regression model shows that only sex, education level, and household income contributed significantly to predictions. The likelihood of a female who knew the health effects associated with improper waste management was 0.56 times lower than the likelihood of men. In the same way, participants who had elementary school and middle school education respectively, tended not to know the implications of waste in the cause of the disease. The POR shows that the participant's income IDR ≥ 2,285,000 was 3.80 times more likely to know the role of waste in the cause of the disease (Table 4).

The results of logistic regression analysis to assess the effect of a set of factors on the likelihood of participants applying safety behaviors related to waste management are presented in Table 5. Age, gender, education level, and overall household income, statistically give significant contributions to this model. The strongest predictor of safe behavior is between the ages of 18 and 35 who have an POR of 4.42. Female participants, with elementary school and middle school education background, and IDR <2,285,000 earnings did not tend to apply safe behaviors (Table 5).

Table 5.The influence of socioeconomic and demographic factors on the safety behavior of participants related to waste management (N = 784)

Variable	Good behavior N (%)	Unadjusted		Adjusted	
		POR 95% CI	*p*-value	POR 95% CI	*p*-value
Age					
18-35	83 (22.1%)	2.70 (1.63-4.84)	0.00	4.42 (1.96-7.70)	0.02
36-40	102 (27.2%)	1.75 (0.88-3.16)	0.05	1.50 (0.76-2.74)	0.00
41-60	168 (44.8%)	1.18 (0.72-1.78)	0.51	0.17 (0.11-0.67)	0.01
≥60	22 (5.9%)	2.16 (1.12-4.52)	0.02	0.20 (0.10-0.94)	0.00
Sex					
Male	201 (53.6%)	0.96 (0.43-1.74)	0.60	0.12 (0.02-0.32)	0.01
Female	174 (46.4%)	0.23 (0.11-0.60)	0.00	1.14 (0.21-1.93)	0.02
Marital status					
Single	64 (17.1%)	3.33 (1.28-5.67)	0.02	2.17 (0.78-4.68)	0.20
Married	156 (41.6%)	1.08 (0.48-2.45)	0.04	1.56 (0.64-4.11)	0.35
Divorce	38 (10.1%)	0.84 (0.44-1.57)	0.30	1.33 (0.54-3.13)	0.80
Widow/widower	117 (31.2%)	1.30 (0.65-2.52)	0.01	1.81 (1.06-3.16)	0.00
Education level					
Elementary School	27 (7.2%)	0.55 (0.17-1.08)	0.00	0.61 (0.14-1.55)	0.00
Middle School	86 (22.9%)	1.22 (0.81-2.58)	0.04	1.74 (0.65-3.65)	0.04
Senior High School	196 (52.3%)	0.83 (0.47-1.48)	0.70	2.15 (1.45-4.84)	0.02
College	66 (17.6%)	1.28 (0.82-2.14)	0.10	2.21 (1.23-3.80)	0.01
Household income (IDR)					
< 2.285.000	122 (32.5%)	0.74 (0.34-1.56)	0.03	1.45 (0.78-2.34)	0.01
≥2.285.000	253 (67.5%)	2.11 (1.18-4.72)	0.04	0.48 (0.13-2.53)	0.00
Distance to a temporary dump/landfill					
< 50 meters	72 (19.2%)	1.53 (0.83-2.75)	0.00	2.26 (1.15-4.41)	0.50
50-100 meters	203 (54.1%)	0.69 (0.48-1.99)	0.01	1.16 (0.85-1.86)	0.06
101-200 meters	54 (14.4%)	1.63 (0.87-2.86)	0.45	0.83 (0.43-1.24)	0.10
> 200 meters	46 (12.3%)	0.81 (0.42-1.68)	0.12	0.66 (0.22-1.54)	0.26

p< 0.05 significant

Note: IDR: Indonesian Rupiah; POR: Prevalence Odds Ratio; CI: Confidence Interval

3.2 Analysis

This study develops a standardized and sustainable approach that identifies the broad spectrum of safety and knowledge-based variables, predicts and then directly examines the impact of socioeconomic and demographic factors related to waste and waste management. The results of this study provide concrete support for the hypothesis that households have important roles and responsibilities in waste management. Predictors of inappropriate waste disposal practices were the level of education, sex, household income, and residence at a distance of more than 50 meters from a temporary dump/landfill. Similar findings have been reported in previous studies (Addo, 2017)(Awunyo,2013).

The authorities should be encouraged to promote environmental information and counseling to the community, because the extent to which people participate effectively, especially women, can only be improved through education and counseling. If garbage is collected by garbage collectors, the costs should be designed to be accessible to low-income communities (Sessa, 2009).

Another important goal of the study was to assess public knowledge about health risks from inappropriate waste management. In general, they had little knowledge of the implications of waste on environmental pollution (Desa, 2011). It should also be noted that most participants were aware that improper waste management causes cholera, typhoid, and malaria. However, there was still a lack of understanding about some important diseases such as dysentery, diarrhea, respiratory infections, and injuries. The level of knowledge of participants was affected by household income, education level, and gender. This suggests that more effort is needed to make the public aware about disease prevention and health promotion with a particular focus on women (Addo, 2015). For economically disadvantaged households who cannot easily have access to mass media, a good outreach program should be provided for information dissemination (Zhang, 2015).

This study has shown that participants should implement basic safety measures regarding waste management such as washing hands properly after garbage disposal, disposing of garbage every day,

putting garbage near an outside door, and sleeping inside mosquito nets. In this study, there were still participants who do not treat water from the unprotected surface, soil and pipe sources before use. In general, inappropriate security behavior was related to age, gender, education level, and household income. In response to this situation, the Banjarmasin government should seek more assistance from development partners to utilize technical assistance and advice to improve community-based health education delivery.

The main strengths of this study were as follows: using large sample sizes with three outcome measures, taking into account confounding factors, and good survey reporting methods. Interestingly, this study can address the needs for comprehensive information and tools to help policymakers and stakeholders adjust their current programs and plan future programs. For educators/health workers, this study can be used to better promote ways on how to handle household waste to a diverse population. And, for researchers, this study will contribute to increasing data comparability.

4. CONCLUSION

This study provides evidence that people were still less concerned about the environment by littering. The practice of waste disposal by ignoring the likelihood of environmental consequences was affected by certain socio economic condition (sex, educational level, and household income) and geographic risk factors (distance to dumps). This suggests that participants did not only have a poor knowledge of the negative health impacts of improper handling of waste but also had unsafe behavior on safety practices. This study recommends that the promotion of environmental information and education/extension community should be done as an effort to prevent disease, improve comfort, environmental friendliness, and public safety. The government can create an environment where innovation and knowledge promotion can flourish. Investing in knowledge and innovation is the key to improving the country's productivity and the people's lives. In addition, the community is expected to re-activate the culture of building toilets at the front of the house or through sewerage, and not to dispose feces into the river.

ACKNOWLEDGEMENTS

The authors were grateful for the help and support given by of all parties to this study, especially for all study participants.

REFERENCES

Addo, L.B., Adei, D., and Acheampong, E.O. Solid waste management and its health implications on the dwellers of Kumasi Metropolis, Ghana. *Current Research Journal of Social Sciences*, 7, (3), 81-93. 2015

Addo, H.O., Dun-Dery, E.J., Afoakwa, E., Elizabeth, A., Ellen, A., and Rebecca, M. Correlates of domestic waste management and related health outcomes in Sunyani, Ghana: a protocol towards enhancing policy. *BMC Public Health*, 17, 615. Doi: 10.1186/s12889-017-4537-8.2017.

Adogu, P.O.U., Uwakwe, K.A., Egenti, N.B., Okwuoha, A.P., and Nkwocha, I.B. Assesment of waste management practices among residents of Owerri Municipal Imo State Nigeria. *Journal of Environmental Protection,* 6, 446-456. Doi: 10.4236/jep.2015.65043.2015.

Ahsan, A., Alamgir, M., Sergany, M.M., et al. Assesment of municipal solid waste management system in a developing country. *Chinese Journal of Engineering*, 561935: Doi: 10.1155/2014/561935. 2014

Aroj, B., Muhammad, A., Ushahid, A., and Qasim, M. Epidemiology impact of solid waste and assessment of awareness level among rural areas of Pakistan. *American-Eurasian Journal of Agricultural & Environmental Sciences*, 14, (9), 831–837. 2004.

Awunyo-Vitor, D., Ishak, S., and Jasaw, G.S. Urban households' willingness to pay for improved solid waste disposal services in Kumasi Metropolis, Ghana. *Urban Studies Research*, Article ID 659425, 8 Pages. Doi: 10.1155/2013/659425. 2013

Banga, M. Household knowledge, attitudes and practices in solid waste segregation and recycling: the case of Urban Kampala. *Zambia Social Science Journal*, 1 (2), 27-39. 2011

BPS Kota Banjarmasin. Population Projection of Banjarmasin City by Age Group Year 2010-2015. 2016. [Accessed date: 29th March 2017].

Desa, A., Kadir, N.B.A., Yusooff, F. A study on the knowledge, attitudes, awareness status an behavior concerning solid waste management. *Procedia-Social and Behavioral Sciences*, 18, 643-648. Doi: 10.1016/j.sbspro.2011.05.095. 2011.

Giusti, L. *A review of waste management practices and their impact on human health*. *Waste Management*, 29, (8), 2227-2239. Doi: 10.1016/j.wasman.2009.03.028. 2009.

Mukarna, T., Ndejjo, R., Musoke, D., Musinguzi, G., Halage, A.A., Carpenter, D.O., and Ssempebwa, J.C. Practices, concerns, and willingness to participate in solid waste management in two urban slums in Central Uganda. *Journal of Environmental and Public Health*, Article ID 6830163, 7 Pages. Doi: 10.1155/2016/6830163.2016.

Malik, N.K.A., Abdullah, S.H., and Manaf, L.A. Community participation on solid waste segregation through recycling programmes in Putrajaya. *Procedia Environmental Sciences*, 30, 10-14. Doi: 10.1016/j.proenv.2015.10.002.2015.

Okechukwu, O.I., Okechukwu, A.A., Noye-Nortey, H., and Agyei, O. Health perception of indiscriminate waste disposal-a Ghanaian case study. *Journal of Medicine and Medical Sciences*, 3, (3), 146–154.2012.

Rahmaddin, M.Y., Hidayat, T., Yanuwiadi, B., and Suyadi.. Knowledge, attitude, and action of community towards waste management in River Bank of Martapura. *International Journal of Applied Psychology*, 5 (4), 96-102. Doi: 10.5923/j.ijap.20150504.03.2015

Sankoh, F.P., Yan, X., and Tran, Q. Environmental and health impact of solid waste disposal in developing cities: a case study of Granville Brook Dumpsite, Freetown, Sierra Leone. *Journal of Environmental Protection*, 4, 665-670. Doi: 10.4236/jep.2013.47076.2013.

Sessa, A., Giusseppe, G.D., Marinelli, P., and Angelillo, I.F. Public concerns and behaviours towards solid waste management in Italy. *European Journal of Public Health*, 20, (6), 631-633. Doi: 10.1093/eurpub/ckp204.2009.

Wikipedia.Profile of Banjarmasin City. https://id.wikipedia.org/wiki/Kota_Banjarmasin.2017 [Accessed date: 29th March 2017].

Zagozewski, R., Judd-Henrey, I. Nilson, S., and Bharadwaj, L.. Perspective on past and present waste disposal practices: a community-based participatory research project in three Saskatchewan first nations communities. *Environmental Health Insights*, 5, 9-20. Doi: 10.4137/EHI.S6974.2011

Zhang, D., Huang, G., Yin, X., and Gong, Q. Residents' waste separation behaviors at the source: using SEM with the theory of planned behavior in Guangzhou, China. *International Journal of Research and Public Health*, 12, 9475-9491. Doi: 10.3390/ijerph120809475.2015.

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Breastfeeding and Husband's Attitude

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Article Info

Keyword:

Breastfeeding,
Husband's attitude,
Support.

ABSTRACT

There are factors that may influence the succeed of breastfeeding, one of them is the importance of husband's support. Husband should have a supportive attitude towards breastfeeding. The aimed of this study were to determine the attitude of husband's towards breastfeeding and identify factors that affect the attitude towards breastfeeding. This researched used qualitative method with phenomenology approach. Data collected using semi-structured interview continued with content analysis to analyzed the data. There are three husband involved in this research whose wives still breastfeeding their children aged between 0-1 years old and also involved three significant person as data source triangulation. The result showed that the three subjects showed a supportive attitude that appears from the cognitive response which is related to their knowledge about breastfeeding and the benefit of breastmilk to baby, affective response related to the pleasure feeling, satisfaction and grateful that his child got breastfed and also felt the benefit, as well as conative that related to the tendency behaviors and concrete action that have been done by all participants in example provide assistance to their wife so that their wife could breastfeeding smoothly and even participate in promoting or sharing information about the importance of breastfeeding to their friends, family or colleague. Furthermore, factors that influence their attitude to support breastfeeding was their personal experience, their significant other especially their wife, and the mass media. On this research, the influence of religious factor was found in subject number three. Lastly, on subject number one and number three, the involvement with breastfeeding community was also the factor that affect their attitude to support breastfeeding.

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1. INTRODUCTION

Breastfeeding is a natural thing and should be started as soon as possible after the baby is born, either through spontaneous or cesarean delivery, as long as the mother and baby are in a healthy and stable condition. This is in accordance with the regulation from Indonesian Ministry of Health in Kepmenkes no 450/Menkes/SK/VI/2004 (Kepmenkes, 2004) regarding exclusive breastfeeding in Indonesia. Breastfeeding is every mother's rights, for both working and non-working mothers. It has been proven that breastfeeding provides benefits, not only for babies and mothers, but also for the welfare of the family. For babies, the benefits of breast milk are protecting the immature baby's intestine as well as giving the best nutrients (Walker, 2010). In addition, according to the American Academy of Pediatrics (AAP), the benefits of breastfeeding are reducing the risk of asthma, gastrointestinal infections, and ear infections, as well as improving infant health (Bono and Pronzato, 2012).

According to the United States Breastfeeding Committee (USBC, 2002), the benefits of breastfeeding for mothers are reducing the risk of breast cancer and cervical cancer, reducing the risk of postpartum hemorrhage and the risk of anemia. In addition, breastfeeding also improves the attachment between a mother and her child. More broadly, for the family or social environment,

breastfeeding brings economic benefits because there is no need for them to spare a budget to buy food or liquid substitutes, such as infant formula, thus reducing packaging waste of the formula which is more environmentally friendly.

In the Holy Qur'an in QS. Al-Baqarah verse 233, itis stated that "Mothers may breastfeed their children for two complete years for whoever wishes to complete the nursing (period)". The verse shows that, in the teachings of Islam, mothers are encouraged to breastfeed their child. Furthermore, the World Health Organization (WHO), the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP) and the Indonesian Pediatric Association (IDAI) recommend exclusive breastfeeding for 6 months which may be continued for up to 2 years. However, in fact, there are still many mothers in Indonesia who cannot maintain breastfeeding until the child is two years old.

The presence of children in the family, of course, provides many changes to the overall condition of the family. The postpartum period has so far been considered a risky condition that is able to improve serious mood disorders (WHO, 2008). Hormonal changes that occur which are accompanied by changes in the role of the mother who must nurture and breastfeed the child require a mother to be able to adjust to the demands. When faced with various demands of the situation, one tends to seek help from others to solve the problem.

According to Dewey (2001), stress conditions, both physically and mentally, experienced by a breastfeeding mother will have an impact on the reflexes of her released milk, which decreases the release of the oxytocin hormone during breastfeeding. If this occurs repeatedly, it can reduce milk production because, at the time of breastfeeding, optimal breast emptying does not occur.

Previous research by Swastiningsih (2014) on two breastfeeding mothers found that although both had a strong desire to breastfeed but in the early breastfeeding, they experienced several problems such as lack of information about breastfeeding, doubt about their ability to breastfeed, lack of support from health personnel or hospital, breast pain, and the crying baby who was difficult to nurse. When faced with these problems, both subjects coped them by looking for problem-focused and emotion-focused solutions such as finding good information by reading, browsing the internet, seeking support, asking, meeting counselors, and also getting support or assistance from others, especially families.

Based on the findings, it can be concluded that if breastfeeding mothers can overcome their problems, it can lead to smooth process of breastfeeding. Some things can improve the success of the breastfeeding process, such as the support of various parties such as the family i.e. husband or mother, health workers, and support groups of breastfeeding mothers (Reeves *et al*., 2006 and Handayani *et al*., 2012). In addition, the results of a study by Reeves *et al*. (2006) on mothers in North Florida showed that breastfeeding mothers needed the most support from their husbands to continue breastfeeding. Studies from Chen and Chi (2000) showed that mothers had a positive attitude toward breastfeeding because they got approval from their husbands and parents so that they chose to breastfeed and not to provide infant formula for their babies. Al-Akour *et al*. (2010) stated that factors that influenced mother to breastfeed successfully were mother's positive attitude towards breastfeeding, mothers' previous experience on breastfeeding, and supportive partner for breastfeeding. Based on those findings, it can be concluded that the role of husband is very important and a wife who is breastfeeding expect a real role from the husband to support her breastfeeding decision.

In Indonesia today, there is a movement that is driven by men who are fathers who show concern about breastfeeding. They believed that breastfeeding is not merely wife's responsibility as a mother but also the father's responsibility. In 2011, a community of Breastfeeding Father (Ayah ASI)was established. It promotes a lot in the cyberspace via twitter account @ID_AyahASI. It has its own website, www.ayahasi.org which is managed by 8 breastfeeding father. Ayah ASI (breastfeeding father) is the name for fathers who support wives to breastfeed their children (http://www.ayahasi.org/gimana-id_ayahasiada, accessed on November 27, 2014). Since then, Ayah ASI community has been growing in almost all parts of Indonesia which is shown by some twitter accounts, such as @Ayahasi_Jakarta, @AyahASI_Bekasi, @AyahASI_Solo, @AyahASI_Lampung, @PapiASI_Plg, @AyahASI_Smg and @Ayahasi_Jogja in Yogyakarta (Gunawan et al, 2012).

The existence of the community shows that fathers have a positive and supportive attitude toward the breastfeeding process. Attitude is a disposition to respond to a thing favorably or unfavorably to an object, person, institution or event (Ajzen, 2005). According to Berkowitz (Azwar, 2005), one's attitude toward objects is either favorable or unfavorable to the object. Cattell (Olson and Hergenhahn, 2013) stated that attitudes can be defined as the tendency to respond to a particular way in a given situation for a particular object or event. In this research, husband's attitude towards breastfeeding means the tendency of a husband to provide support or being supportive or not to

support or show impartial response to various matters related to the behavior of his wife to breastfeed.

Husbands are expected to have positive attitude or be supportive towards breastfeeding. Husband's supports are beneficial and can give positive impacts such as smooth flow of breast, mother's enthusiasm to breastfeed, mother's comfortable feeling, and mother's perceived burden decrease (Annisa and Swastiningsih, 2015). A father's positive attitude to breastfeeding is likely to lead to breastfeeding initiation and continuance, for example through confidence to breastfeed in public and challenge negative perceptions from peers, health professional and others (Sherriff et al, 2014).

In this research, there are three attitude responses to identify husband's attitude towards breastfeeding, which is in line to Ajzen (2005), including cognitive response, affective response and conative response. Cognitive response is the reflection of perceptions and thoughts about the object of attitude. Verbally, it can be shown through the expression of beliefs about the object of attitude, whereas, nonverbally, it is a perceptual reaction about the object of attitude. Affective response relates to evaluation and feelings toward attitude objects. Verbally, it can be demonstrated by expressing feelings toward the object of attitude and is nonverbally visible from physiological reactions to object attitudes such as changes in the pupils, heartbeat, blood pressure, and facial muscle reactions. Conative respond appears from the tendency of behavior, intention, commitment and action related to attitude object. Verbally, it can be seen through the expression of intentions of a behavior as what someone says, done, planned or will be done under the right conditions. Nonverbally, it is demonstrated through the apparent behavior that appears to object attitude.

Azwar (2005), stated that there are several factors that can affect the formation of an attitude that is personal experience, the influence of significant other, culture, mass media, educational or religious institution, and emotional factor. According to Sherriff et al (2014), the occurrence of a husband's positive attitude towards breastfeeding is influenced by positive aspirations from mothers and fathers to want to breast feed at home and/ or in public, health professionals acknowledging the role and contribution of the father in supporting breast feeding, positive attitudes of others such as immediate and extended family, peer groups, and influential others, as well as supportive cultures or settings where attitudes to breast feeding are played out (e.g. in public places such as cafes, restaurants and work places) that normalize breast feeding in public.

2. RESEARCH METHOD

This research used qualitative method with phenomenological approach to reveal the attitude of husbands and factors that affect husbands' attitude towards their wife's breastfeeding behavior. Subjects on this research were three husbands whose wives were still breastfeeding their child (aged 0-1 years old) which were chosen based on criterion sampling. Criterion sampling involved a special standard of what was needed by the researchers. Researchers selected respondents who met several criteria. This was done to ensure the data quality (Poerwandari, 2017).The point of criterion sampling is to be sure to understand cases that are likely to be information-rich because they may reveal major system weaknesses that become targets of opportunity for program or system improvement (Patton, 1990).

The data was collected by using semi-structured interview to all three subjects. To fulfill the research trustworthiness, the significant person for each subject was interviewed for data source triangulation.

Table 1. Research subject's profile

No	Profile	1st Subject	2nd Subject	3rd Subject
1	Name (initial)	AP	DS	SN
2	Age	36 years old	30 years old	34 years old
3	Occupation	Private employee	Entrepreneur	Private employee
4	Latest Education	Bachelor's degree	Bachelor's degree	Bachelor's degree
5	Number of children	2	2	2
6	Children age	6 years& 4 month old	4 years& 10 months old	6 years& 1 years old

Table 2. Significant person's profile

No	Description	1st Subject	2nd Subject	3rd Subject
1	Name	AS	BN	OA
2	Gender	Female	Female	Female
3	Age	34 years old	30 years old	29 years old
4	Latest Education	Bachelor	Bachelor	Bachelor
5	Occupation	Lactation counselor	Housewife	Entrepreneur
6	Relationship with subject	Wife	Wife	Wife

3. RESULTS AND DISCUSSION

Findings of this study explain about the husbands' attitude response which are classified into three aspects, i. e. cognitive response, affective response and conative response as well as explain about factors that affect the emerge of husband's attitude towards breastfeeding.

3.1 Results

3.1.1 Husband's attitude towards breastfeeding

Cognitive response

All subjects had a good knowledge related to the benefits of breast milk and the importance of breastfeeding for both mother and baby. Subjects also knew about breastfeeding procedures,starting from breastfeeding early after the baby was born or known as IMD (early breastfeeding initiation), giving exclusive breastfeeding, giving complementary food after 6 months, and also weaning time for the baby. Subjects believed that breast milk was the best for baby and breastfeeding was useful to build closeness between a mother or parent and a child. These beliefs made the subjects support their wives to breastfeed their children to the optimum extent possible.

> *Yes it's very important for the health of the baby, especially when given early, starting from the first month to 6 months to form the immune system. After birth, the Colostrumis a bit yellowish in color from the mother. It is the source of vitamin and is useful for body endurance. (SN)*
> *Breastfeeding is very important and irreplaceable. (AP)*

Affective response

The three subjects expressed satisfaction, happiness and gratefulness that their children can be given breast milk because they felt the positive benefits of breast milk. It also appeared that subjects cared and gave extra attention concerning their wives and children. The three subjects also felt comfortable when their wives shared their breastfeeding experience or discussed their breastfeeding issues. When the wife had difficulty in breastfeeding, the subjects showed their concerns and empathy towards the worries and difficulties faced by their wives and tried to help overcome the problems, by attempting to make their wives and children happy and also comfortable. Subjects also felt comfortable and enthusiastic when sharing stories about breast milk and breastfeeding with others, like friends and colleagues.

> *Sometimes I felt sorry to see my wife feeling tired, so I gave her massage, and usually I helped her to take care of my daughter at night so that she could have a rest.*
> Alhamdulilah*... Yes, I'm happy, I'm glad that she is a housewife so she can focus on our daughter, the most important thing is our children's health.*
> *(DS)*
>
> *There's one child in my parent-in-law's neighborhood. That child is not breastfed…. …Compared to my daughter, that little girl often got sick while my daughter is not. My daughter is healthier, more active and intelligent. (AP)*
>
> *I, as a husband, think it's positive (breastfeeding), I support her.. I'm happy and excited.(SN)*

Conative response

Subjects expressed approval and support to their wives to be able to breastfeed their children. When the wives had difficulty or problems in breastfeeding, subjects would show their effort to help. Things that had been done by subjects was to help finding a solution like seeking information via the Internet, reading books, asking other people who had more experience, asking the doctor or to

the parent or in-laws. Subjects also took concrete actions to help their wives or make their wives feel comfortable such as massaging them when they were exhausted, babysitting the baby when their wives did chores or other works, giving their wives a chance to rest, and even promoting the benefits and importance of breastfeeding to motivate others to breastfeed.

> *...We tried to share the task at home as much as possible. She has her focus more on M (2nd child who is still breastfed), and I'm on A (1st child). I also accompany A to sleep…so that she wouldn't feel abandoned.*
> *All my friends...in the office or even my high school friends... I always give them information about breastfeeding… some friends asked me why she could not produce milk, about difficulties on breastfeeding... If I didn't know the answer then I'd asked my wife for the solution because she is a counselor (AP)*
>
> *Mostly from the internet, why can she not produce a lot of milk? What does she need to do to increase milk supply? (DS)*
>
> *The most important support is from a husband. Whenever she felt exhausted, I tried to calmed her down and gave her support to encourage her.*
> *Colleagues in my office who had a newborn baby often asked me about breastfeeding… there are three pregnant women in my office, I already told them to prepare for breastfeeding...(SN)*

3.1.2 Factors influencing the attitude

There were some factors that affected subject's attitude towards breastfeeding.

Personal experience

Subjects found out the benefits of breast milk and were also able to see that their children were becoming more healthy and active. For subject SN, he revealed that there was a difference between his condition, who was not beastfed, and his sister who was breastfed until the age of 3, i. e. her physical condition was healthier than SN.

> *I wasn't breastfed fully for two years, but my sister was. We have different condition and she is healthier than me. I've ever read a literature that when someone doesn't get enough breastmilk, some of their body function and physical health will be affected. (SN)*

Significant other

Subject's significant other, such as wife, mother and others who had more experience, played an important role in influencing subject's attitude. Subjects mostly got information about breastfeeding from their wife.

> *From my mother, she helped us a lot, she told me about the importance of exclusive breastfeeding, and the doctor said so, as well. (DS)*
> *I often listened to my wife's story when she met her home visit clients about breastfeeding problems... and the solution. Baby shouldn't take milk from a bottle. If you want to give expressed breastmilk, you better use spoon, syringe, cup feeder, etc. (AP)*
> *I got the information about breastfeeding from a breastfeeding community. My wife joined a community named AIMI. (SN)*

Mass Media

Subjects gathered information and knowledge related to breastfeeding from the internet and mailing list.

> *I often googled to find information that I'm curious about, like what is inside breastmilk? (SN)*
> *The source of information is from the internet, and there's a mailing list named ASI for Baby. (AP)*

Religious belief

Religious belief influenced subject SN to support breastfeeding. This belief is related to the teachings of Islam because SN is a moslem.

> *That's why at the period of prophet Muhammad SAW, baby shouldn't be "breastfed by cow" but you could ask another mother to nurse the children if the biological mother could not breastfeed them. I didn't suggest my wife to give formula for the baby and that she should nurse the baby for 2 years. Yes, 2 years is in accordance with the sunnah of the prophet. It is because, from what I see from the development of my first daughter, it is true and that is why the prophet said that babies should be breast fed until they are two years old...it is good for their body endurance. (SN*)

The involvement to pro-breastfeeding communities

Subjects AP and SN had a connection with a community concerned with breastfeeding in Indonesia because both of their wives were the members of the community. Subject AP's wife was a breastfeeding counselor and SN's wife, although not a breastfeeding counselor, was involved as an administrator in the community. The involvement of their wives in the community provided many positive influences such as gaining increased knowledge of breastfeeding including its benefits. It enhanced their positive attitudes or supports for their wife in breastfeeding.

> *…problems related to breastfeeding for example not able to produce milk, then I asked AIMI's counselor…sometimes the information cant be found in google, I knew it from the association.. (SN)*
> *We know about AIMI when my first daughter 1 or 2 years old, since then she became activist on the organization. (AP)*

3.2. Analysis & Discussion

3.2.1. Husband's attitude towards breastfeeding

Eagly & Chaiken (1993) suggest that attitudes can be positioned as an evaluation of attitude objects (see Figure 1), which is expressed in cognitive, affective, and behavioral or conative processes. Individuals who have a negative evaluation of breastfeeding might have an opinion that breastfeeding is not good for the shape of the breast. Conversely, a positive evaluation will cause the individual to argue that breastfeeding by the wife is beneficial for the infant growth. The subjects of this study know about the good benefits of breastfeeding for the health of the mother and the child. Breastfeeding by the mother is also useful to establish the closeness between a mother and her child.

The evaluative response in the form of affective is individual feelings toward the object of attitude. Individuals who respond positively will be happy with the object of attitude. Conversely, individuals who respond negatively will feel unhappy, fearful, worried, and may be angry at the object of attitude. When applied to breastfeeding by their wives, the subjects of this study were happy, satisfied and grateful that their wives could breastfeed their child, because the subjects felt the benefits of breastfeeding for the growth of their children.

The evaluative response of conative aspect can be shown in subject's behavior that supports the object of attitude. Conversely, individuals who evaluate negatively will steer clear of or reject the object of attitude. The subjects in this study showed positive behavior that supported their wives to breastfeed their babies. Subjects tried to look for solutions when their wives had problems in giving breast milk. Subjects also exhibited concrete behaviors such as caring about the condition of the wife by assisting in the nurturing process, especially raising the older child while the wife focused on the younger child who was still breastfed. The subjects also gave massages to their wives, gave the wife a chance to rest or do something else while the subject was taking care of the baby. Subject AP and SN did not even hesitate to promote or educate others, like their coworkers or friends, about breastfeeding.

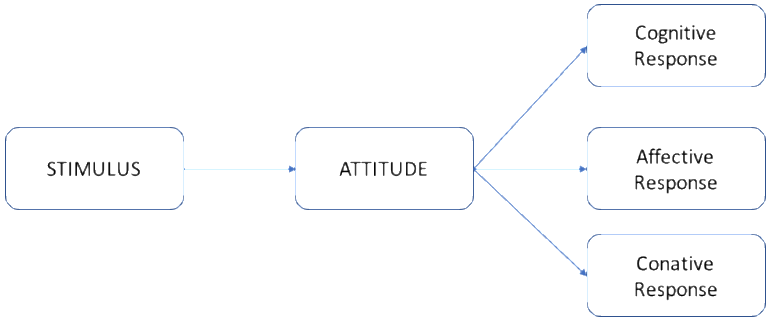

Fig 1. Attitude as a result of evaluation (Eagly & Chaiken, 1993)

Attitude is a form of individual evaluation of the attitude object shown by beliefs, feelings or expected behaviors. As an evaluative response, the reaction expressed by attitude is based on an evaluative process from within the individual that gives conclusions to the stimulus in the form of values, i. e. good-bad, positive-negative, pleasant-unpleasant values which are then crystallized as a potential reaction to the attitude object.

An attitude can lead to concrete behavior. The theory that is often used to explain the relationship of attitude and behavior is the reasoned action theory developed by Fishbein and Ajzen (Veitch & Arkkelin, 1995). The theory of reasoned action is still widely used as the main theoretical framework for research. The theory of reasoned action seeks to establish the factors that determine the consistency of attitudes and behaviors. This theory assumes that people behave fairly rationally. A reasonable model of action about the factors that determine a person's behavior is described by Feishbein and Ajzen and is illustrated in the figure below:

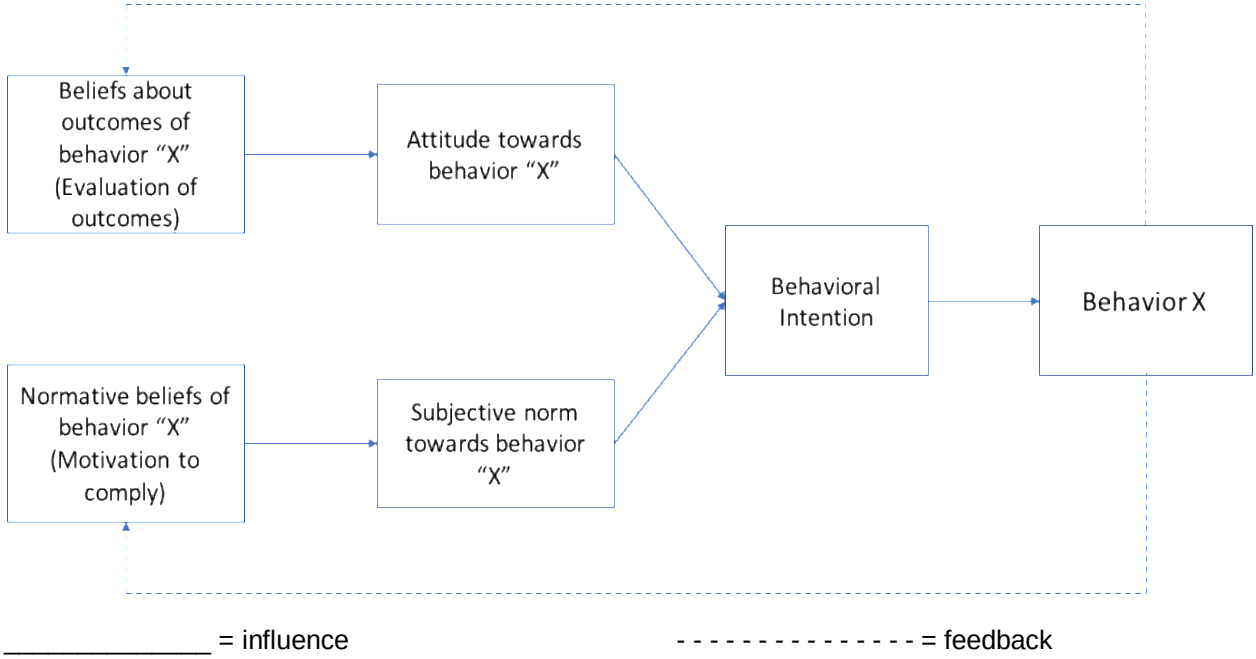

Fig 2. The model of reasoned action theory (attitude-behavior relationship)

According to Fishbein and Ajzen (Veitch & Arkkelin, 1995), attitude can predict behavior by seeing the intention to behave. Intention is influenced by attitudes toward the object (behavioral attitude), and a person's subjective norm about the behavior. The subjects of this study had a belief that breastfeeding by the wife would provide many benefits, so the attitude of the subjects was positive. Subjects felt that people around them, like their mothers, friends, and the members of the breastfeeding community, gave support to women to breastfeed (normative belief), and subjects followed it (subjective norm). The subjects' positive attitude and subjective norm encouraged them to approve their wives to give breast milk. Thus, it could be predicted that the subject's behavior would be in line with his attitude. Subjects showed behaviors that support their wives to breastfeed by providing the help needed by the wife. The subjects even participated in giving campaign on the importance of breastfeeding for infants.

3.2.2. Factors influencing husband's attitude towards breastfeeding

There are factors that may affect someone's attitude towards certain object. Azwar (2005) describes several factors that can influence the formation of attitudes such as personal experience, the influence of others who are considered important, culture, mass media, education and religious institutions, and emotional factors. In this study, several factors that could be firstly identified first was based on personal experience. Azwar (2005) further explains that personal experience which leaves a strong impression, especially involving emotional factors, can form an attitude towards object. The three research subjects showed feelings of pleasure, satisfaction and even gratefulness because breast milk had a positive impact on their children, especially on their children's health in addition to strong bonds built between the mother and the child.

The influence of significant others played an important role to subjects' attitude towards breastfeeding. For the three subjects, the most important significant other for them was the subjects' wives. The role of the subject's wife was to provide knowledge about breast milk and breastfeeding so that husbands believed the importance of breastfeeding to support their wives' choice and decision to breastfeed. Besides their wives, there were other people who gave influence about their attitude towards breastfeeding, i. e. subject's mothers or parents.

The role of mass media is also significant in adding information or knowledge about breast milk and breastfeeding. Subjects got and sought information particularly through the internet or reading books. When faced with problems related to breastfeeding, all subjects tried to find solutions by finding information through the internet. According to Azwar (2005), the existence of information about a thing can provide a new cognitive foundation for the formation of attitudes toward it. The suggestive message that the information brings, if it is strong enough, will provide an affective basis for judging a part so that a certain attitude is formed. Previous study by Sherriff et al (2009) found that fathers play a key role in supporting breastfeeding. In order to support breastfeeding, the results showed that fathers also need greater support, information and advice on practicalities of breastfeeding and especially knowing the best way to help their partner.

Other factors that influence attitude found in this research were the understanding of religion and involvement on breastfeeding support community. The religious factor found in subject SN. Religion was used as the foundation of his attitude to support breastfeeding activities. On the basis of beliefs in the religious teachings of Islam that breastfeeding is sunnah until a child is two-year-old, subject SN supported his wife in breastfeeding. In addition, the subject also knew that if a mother could not breastfeed her child then they should find another mother to breastfeed their child, just like what was done at the time of Prophet Muhammad SAW.

Furthermore, for subjects AP and SN, they had a thing in common which was the subject's wives' involvement in breastfeeding support community. From the community, they had access to a lot of information about breastfeeding. Moreover, for subject AP, his wife was a breastfeeding counselor who had a lot of knowledge and experience about breastfeeding based on self-experience and from the clients she handled. Based on that fact, it could be concluded that it was a knowledge foundation that affected the emergence of supportive attitude towards breastfeeding.

Based on discussion above, it can be concluded that knowledge is the key to the formation of husbands' attitude in supporting their wives to breastfeed. In addition, the attitude of the husband had been transformed into the connective realm that was shown in their tendency of behavior. There was even the appearance of a real action. Actions in the form of assistance or support were also felt by the three wives of the subject. Their wives stated that they got real assistance and emotional support, such as their husband's willingness to listen to their wives' complaints or problems, the husband's assistance in taking care of their children and their willingness to comfort their wives whenever they felt uncomfortable. Here is a model of attitude formation of the subjects in this study, as shown in the picture below.

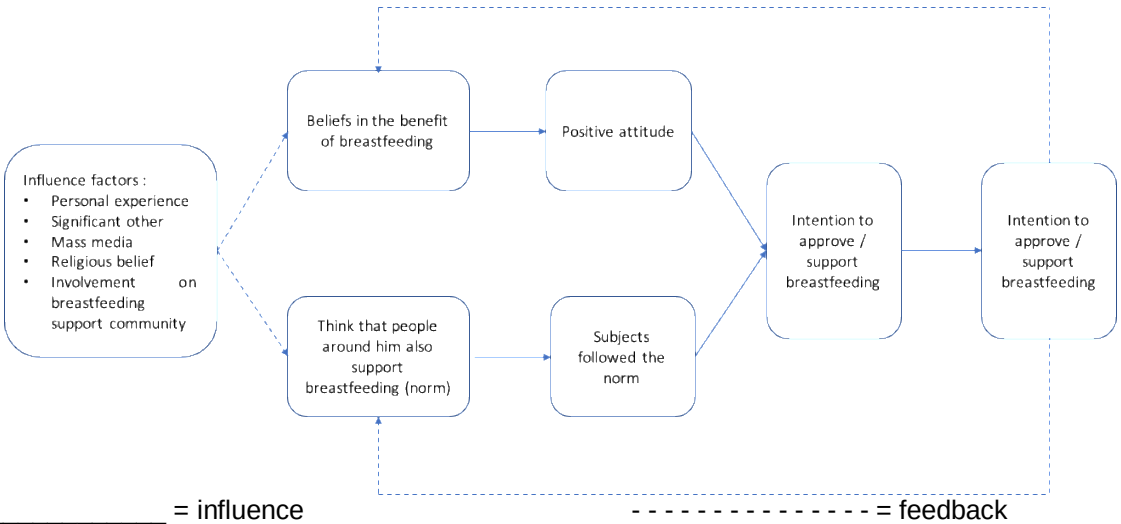

Fig 3. The dynamic model of subject's attitude formation

4. CONCLUSION

Based on the results of research that has been done, it can be concluded that the attitudes of husbands towards breastfeeding were positive and they supported their wives to breastfeed. The attitude seen from the attitude response was the cognitive response based on the subjects' statements that they supported their wives to breastfeed due to their knowledge about breast milk and its benefits. In affective response related to the involvement of the feelings towards the attitude object, the three subjects showed feelings of pleasure, satisfaction and gratefulness that their children got breast milk because they felt the benefits themselves. On the other hand, the conative response, which was the tendency of behaviors and concrete actions that had been done by the subjects to provide assistance to the wife for the sake of breastfeeding process, such as taking care of their wives so they were not stressed, giving their wives massage, helping taking care of the child while giving the wife the opportunity to rest or to do other things and also promoting or sharing information on the importance of breastfeeding to others.

Some factors that could affect the formation of the husband's attitude towards breastfeeding were the subject's personal experience on the benefits of breastfeeding for children to make the child's physical condition healthier and more active. Furthermore, there was also the influence from the significant other, especially from their wives, who provided a lot of information and knowledge about breast milk and breastfeeding. From the knowledge, came the form of support for the wives. The next factor was the influence of the mass media as information source that provided additional knowledge for the subjects, meaning that it played a role in shaping a supportive attitude. In addition to the three factors, there was also an additional finding about another factor that affected the subjects' attitude, which was their understanding or beliefs of religion. According to subject SN, nursing is the sunnah of the Prophet so there is a tendency to follow it. In addition, subjects AP and SN had an easy access to breastfeeding support communities through the involvement of their wives in the community. From the community, there was a lot of information about breastfeeding, so the more information obtained the more approval the subjects showed on breastfeeding. This research is intended for husbands whose wives are still breastfeeding their children. This factor is the strength of the research since it is very rare to find research that uses husbands as its subject. The weakness of this research is the limited number of subjects, with a total of three subjects.

Some suggestions for further study include:

1. Husband's supportive attitude toward breastfeeding activities of the wife is very important. It is also necessary to provide proper education about breastfeeding for husbands since a husband will support his wife to breastfeed if he knows the benefits and importance of breast milk for babies.
2. This research is a qualitative study with a limited number of subjects and is only focused to find out the attitude of the husbands. To be able to generalize the findings of the research, there needs to be more research subjects.

ACKNOWLEDGEMENTS

We would like to express our gratitude to all three subjects and three subjects' significant people who participated in this research. Our appreciation is also directed to Department of Research and Development, Universitas Ahmad Dahlan, that funded the study.

REFERENCES

Ajzen, I. 2005. *Attitudes, Personality and Behavior*. 2nd ed. England : Open University Press.

Al-Akour, N.A., Khassawneh, M.Y., Khader, Y.S., Ababneh, A.A., Haddad, A.M. 2010. Factors affecting intention to breastfeed among Syrian and Jordanian mothers: a comparative cross-sectional study. *International Breastfeeding Journal*. 5:6. http://www.internationalbreastfeedingjournal.com/content/5/1/6

Azwar, S. 2005. *Sikap Manusia, Teori dan Pengukurannya*. Edisi ke 2. Yogyakarta : Pustaka Pelajar.

Bono, E. D. dan Pronzato, C. 2012. Does Breastfeeding Support at work help mothers and employers at the same time?.*ISER Working Paper Series*. No 2012-06.

Chen, C.H., dan Chi. C.S. 2000. Factors Associated with Maternal Decision Regarding Infant Feeding. *Clinical Neonatology*. Vol 7. No 1. 24-29.

Dewey, K. G. 2001. Maternal and Fetal Stress Are Associated with Impaired Lactogenesis in Humans. *The Journal of Nutritions.* 3012s-3015s. http://nutrition.highwire.org/content/131/11/3012S.short**.** Diakses tanggal 16 Februari 2015

Eagly, A.H. and Chaiken, S.1993. The Psychology of Attitudes, Fort Worth: Harcourt Brace Jovanovich College Publishers.

Gunawan, P., Nurprasetyo, D. A., Pontoh, S., Hidayat, A. R., Sudarto, A., Hidayatullah, S., Prakasa, E., Dhuaja, S. I., 2012. *Catatan Ayah ASI, Kami Bukan Ahli, Cuma Mau Berbagi*. Tangerang : Buah Hati

_____ . 2011. Gimana @ID_AyahASI ada? http://www.ayahasi.org/gimana-id_ayahasi-ada. Diakses tanggal 27 November 2014

Handayani, L., Kosnin, A.M., Jiar, Y.K. 2012. Breastfeeding education in term of knowledge and attitude through mother support group. *Journal of Education and Learning*. Vol 6 (1). 65-72

Janiwarty, B. dan Pieter, H. Z. 2013. *Pendidikan Psikologi untuk Bidan. Suatu Teori dan Terapannya*. Yogyakarta : Rapha Publishing

Kepmenkes no 450/Menkes/SK/VI/2004 tentang Pemberian ASI secara Eksklusif di Indonesia

Poerwandari, K. 2017. *Pendekatan Kualitatif untuk Penelitian Perilaku Manusia.* Jakarta: LPSP3 UI

Olson, M. H. dan Hergenhahn, B. R. 2013. *Pengantar Teori-teori Kepribadian*. Edisi kedelapan. Yogyakarta : Pustaka Pelajar

Patton, M. 1990. *Qualitative evaluation and research methods*. Beverly Hills, CA : Sage

Peraturan Pemerintah Republik Indonesia nomor 33 tahun 2012 tentang Pemberian Air Susu Ibu Eksklusif

Reeves, C.C., Close, F.T., Simmons, M.C., Hollis, A.L. 2006. Social support indicators that influence breastfeeding decisions in mothers of north florida. *Florida Publich Health Review*. 3. 1-7. http://publichealth.usf.edu/fphr

Sherriff, N., Hall, V., Pickin, M. 2009. Father's perspective on breastfeeding: ideas for intervention. *British Journal of Midwifery.* Vol 17 (4). 223-227

Sherriff, N., Hall, V., Panton, C. 2014. Engaging and supporting fathers to promote breast feeding : A concept analysys. *Midwifery*. 30. 667-677

Swastiningsih, N. 2014. Stres dan *Coping* pada Ibu Menyusui yang Bekerja. Laporan Penelitian LPP. Universitas Ahmad Dahlan (tidak diterbitkan)

United States Breastfeeding Comittee (USBC). 2002. *Benefits of Breastfeeding*. Raleigh, NC: United States Breastfeeding Committee

Veitch, R. & Arkkelin, D. 1995. *Environmental Psychology: An Interdisciplinary Perspective.* Englewood Cliffs, New Jersey: Prentice Hall

WHO. 2008. *Literature review of risk factors and interventions on Postpartum Depression*. Maternal Mental Health and Child Health and Development. Departement of Mental Health and Substance Abuse

Oral Health Promotion for Children with Special Needs

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Article Info

Keyword:

Oral Health Promotion,
Children,
Special Needs

ABSTRACT

Children with special needs have a higher risk of oral health problems because they have mental and physical limitations to perform its own optimal dental cleaning. The dental problem that usually appears in children with special needs is caries (holes) of the teeth, bloody teeth, and the teeth are crammed into (crowding). This study presents a systematic review aimed to examine the findings of existing studies (2001-2016) on the role of oral health promotion on children with special needs. A systematic search using *databases,* EBSCOhost ProQuest, and Science Direct do. 203 articles were extracted and verified and produced. A new interpretation of the concepts are extracted. Ten articles that met the inclusion criteria studies were included in this review. In the program of oral health promotion, the environmental nearby house that parents, siblings, and caregivers are a major shaper of behavior in children. Efforts to promote oral health for children with special needs is the provision of information to teachers and parents in the maintenance of oral health, so the guidance and monitoring of the behavior of the maintenance of oral health for children with special needs can be implemented both at school and at home.

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1. INTRODUCTION

The result of Health Research (Riskesdas) in 2013 shows that the national prevalence of oral and dental problems is 25.9 percent [Kementerian Kesehatan, 2010]. Good oral hygiene is one of the most important things for the growth of children, including children with special needs (disabled children). They (children with disabilities) are children who have mental disorders, like autism, Down syndrome and cerebral palsy(Kencana, 2014). Children with special needs have a higher risk for oral health problems because they have mental and physical limitations to perform their own optimal dental cleaning.

Special needs children are at high risk of health problems.They need assistance and cooperation with others to obtain and maintain health, including in maintaining healthy teeth and mouth(Kiswaluyo, 2008).Clean teeth and mouth are very important to support the children's lives. Cavities and gum diseases can occur in all children, but children with special needs experience them more often. This is due to their limited cognitive ability and mobility, behavioral and muscular disorders, vomiting reflex and uncontrolled body movements (Al-kotb H, 2017). The condition restricts these children to be able to perform optimum dental cleaning and put them at risk of oral health problems (Liu Z, 2014).

Health education service is the most basic dental health promotion. Dental health education is needed to improve teeth health, for example by choosing appropriate foods which are harmless to teeth, setting the pattern for foods containing sugar (Bertness, 2009). With the dental health education program is expected to increase knowledge and awareness of the importance of maintaining healthy teeth and mouth.

Low mental capability in children with intellectual challenges will influence their ability to carry out

their social functions. Retarded child is a child who does not have enough power and is unable to live on his/ her own in the society (Bhambal, 2011)(Di S, 2017)(Mathuri, 2017). If he/ she could live, he/ she must be in a very good condition. The description shows that children with intellectual challenges who are dependence on others essentially still exist, albeit each Down syndrome child has different quality levels, depending on the Down syndrome's level suffered.

In children, the influence of parents is very strong. The attitude and behavior of parents, especially mothers, in the maintenance of tooth influence the children's oral health significantly (Triyanto R, 2015)(Kencana, 2014).The role of parents is indispensable in guiding, providing a sense of hygiene, reminding, and providing facilities to children so that they can maintain their dental and mouth hygiene, especially in the use of dental and oral health services. Knowledge of parents is very important in the formation of the underlying behaviors that support or do not support the child's oral hygiene (Thomas, 2011). The knowledge of parents about oral health can be obtained through oral health education given in the form of counseling (Waldron, 2017). Extension to the community, both public schools and the general public, is an attempt to guide the children or society towards a change in behavior we expect.

2. RESEARCH METHOD

The method used in this study was systematic review. Systematic Review is a structured literature review designed to answer questions clearly formulated. A systematic review uses systematic and explicit methods to identify, select and critically evaluate relevant research questions, as well as collect and analyze data from the studies included in the review.

Search Methods

Several different databases were investigated to identify thepublished articles. A systematic search on EBSCOhost, ProQuest database was done by using a search string * AND AND oral health promotion special needs children. The search was limited to studies published within the period of January 2001 to January 2018. Meanwhile, systematic search on ScienceDirect database was done by using the search string * AND (oral health promotion) AND (topic, "children with special needs) and are found in the pub-date> 2000.

Selection Criteria

Researchers define the criteria for inclusion. Articles are reviewed if they meet the following criteria: 1) original research articles; 2) reporting the role of oral health promotion or the factors that contribute to oral health in children with special needs; 3) full text; 4) in Indonesian or English, because the researchers do not understand foreign languages other than English. The exception is based on the following criteria: 1) data relating to dental health in children with special needs that are not reported independently; 2) there is no attempt to access unpublished studies or literature 'gray'. The articles were tabulated in chronological order with the following subtitles: reference and countries, designs and samples, instruments and collected data, the purpose, and findings.

The article selection process is described in the picture below:

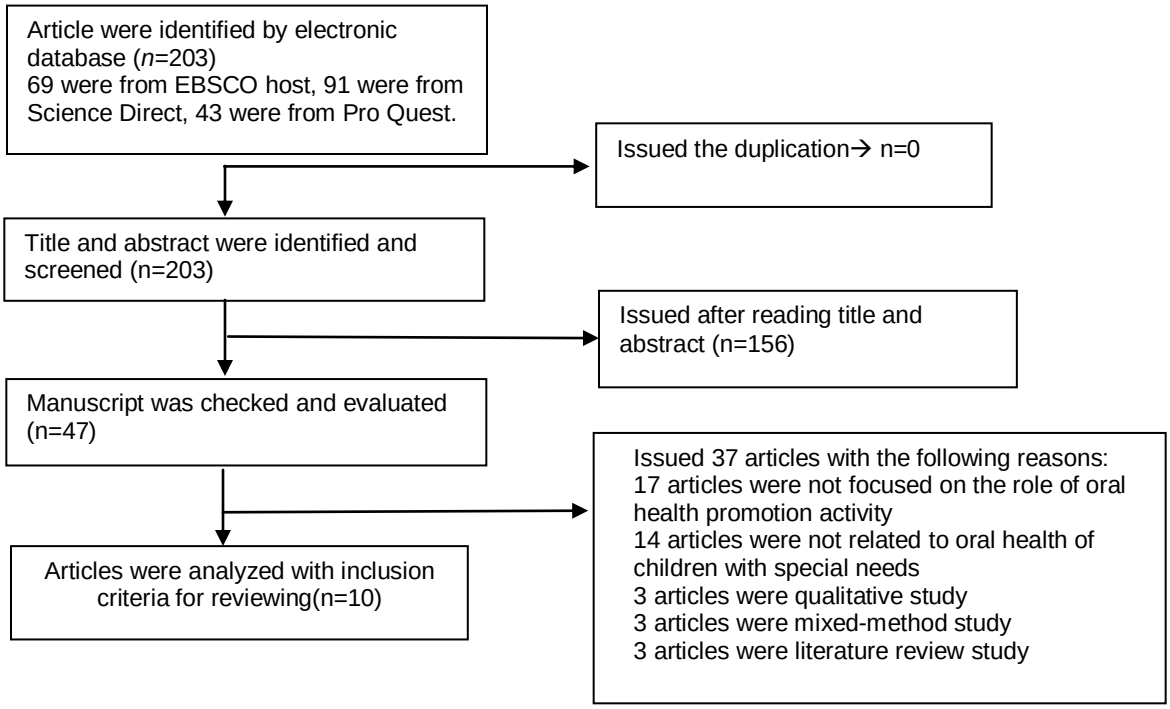

Figure 1. Schematic Flow of Systematic Review

Results of Articles

Initially,there were 203 collected articles consisting of 69 articles from EBSCOhost, 91 articles from Science Direct, and 43 articles from Pro Quest. After examining the duplication of articles, whereas there were no duplicates, the process continued withthe analysis ofthe 203 articles' titles and abstracts. There was not any specific evaluation criteria used when performing a systematic review using diverse empirical sources; one approach was to evaluate the quality of the methodology and the value of information.

3. RESULTS AND ANALYSIS

A total of 10 articles were successfully analyzed by systematic reviewmethod. These articles were of different kind of studies with varied methodologies: 5 cross-sectional studies, one with a randomized control trial, 3 with survey method, and 1 with retrospective studies.Whereas, the setting of the research was also varied as they were conducted in different countries, i. e. USA, China, India, Thailand, Ireland and Taiwan. Five articles were published in the period of 2010-2014, while five other were published in the period of 2015-2018. The design and findings of the ten articles are as described in the table below.

Author	Title	Method	Variable	Results
Zifeng Liu Dongsheng Yu, Wei Luo Jing Yan, Jiaxuan Lu, Shuo Gao Wenqing Li and Wei Zhao	Impact of Oral Health Behaviors on Dental caries in the Children with Intellectual Disabilities in Guangzhou, China	Cross-sectional study	● Oral health behaviors ● Caries experience of children with intellectual disabilities	● The presence of cerebral palsy contributed to an increase of risk of caries experience in intellectually disabled children. ● Brushing teethfor more than twice a day and routine dental visits were caries-protective factors. ● Oral health promotion action may lead to a reduction in dental caries levels in IDC.
Author	**Title**	**Method**	**Variable**	**Results**

Kenneth W. Norwood, Jr., Rebecca L Slayton	Oral Health Care for Children with Developmental Disabilities	Survey	● Oral health of children with developmental disabilities ● Partnership between the pediatric medical service and dental homes	● Pediatricians may use the report to guide them in reviewing their incorporation of oral health assessments ● Pediatricians may use the reportto guide the for well-child examinations for children with developmental disabilities. ● This report has medical, legal, educational, and operational implications for practicing pediatricians.
Tippanart Vichayanrat and Waritorn Kositpumivate	Oral Health Conditions and Behaviors among Hearing Impaired and Normal Hearing College Students at Ratchasuda College, Nakhon Pathom, Thailand	Survey	● Socioeconomic factors ● Hearing status ● oral health behaviors ● Oral hygiene levels ● Dental caries status	● The high prevalence of dental caries and poor oral hygiene among college students is alarming. ● Hearing impairment did not appear to affect the prevalence of those with hearing impairmentcompared to those with normal hearing. ● Oral health education tools need to be developed and utilized both for normal hearing and hearing impaired college students in Thailand
Ajay Bhambal, Manish Jain, Sudhanshu Saxena Sonal Kothari	Preventive Oral Health Protocol for Mentally Disabled Subjects- A Review	Survey	● Oral health status of mentally disabled ● Various preventive measures for dietary counseling and health education to caregivers ● Dental care and various patient management ● Environment techniques, communication skills to the make the treatment acceptable for such pupils	● It is most important to provide preventive dental care to such patients by overcoming the barrier. ● Before motivating the patients and caregivers, it is the dentist who has to be motivated first in fulfilling special health care needs of patients that will result in improvement of the quality of life.
Aditi Mathuri, Vikram Pal Aggarwal, Anmol Mathur	Oral Health Status and Treatment Needs among Differently Abled Children	A cross-sectional study	● Oral health status ● Behavior among differently abled children	● In comparison with normal children, the disabled subjects were not given enough dental care with respect to their needs.

Author	Title	Method	Variable	Results
				• Taking into consideration the multi-factorial influence on oral health status of thepresent disabled population. Oral health promotion and intervention programs should be targeted and concentrated towards these risk groups.
Bharathi M purohita, Abhinav Singh	Oral health status of 12-year-old children with disabilities and controls in Southern India	A cross-sectional study	• Periodontal status, • Dental caries, • Treatment needs • Dental malocclusion using WHO criteria	Poor oral health of children with disabilities compared to those in the control group in terms of periodontal status, dentition status, treatment needs, and dentofacial anomalies found in the study. It confirms a need of preventive treatment for those children.
Radhika Lamba, Harsh Rajvansh, Zeeshan Sheikh, Manpreet Khurana, Rooposhi Saha	Oral Hygiene Needs of Special Children and the Effects of Supervised Tooth Brushing	A cross-sectional study	The oral hygiene status before and after supervised tooth brushing education among institutionalized differently abled children between the age of 6 to 18 years	The disabled groups showed poor oral hygiene even after the education which may be attributed to the lack of coordination, understanding, physical disability or muscular limitations. More attention needs to be given to the long-term dental treatment. These special needs children need to go through accurate disease detection, diagnosis and prevention through habit forming and relevant treatment interventions.
Catherine Waldron, Caoimhin MacGiolla Phadraig, June Nunn, Catherine Comiskey, Erica Donnelly-Swift, Suzanne Guerin, Mike J Clarke	Oral Hygiene Programs for People with Intellectual Disabilities	Randomized controlled trials (RCTs)	• Behavior management techniques • Education • Management support and guidance, stakeholder engagement, specially designed or adapted oral hygiene aids	Behavior management techniques may improve the cooperation of individuals with ID when performing oral hygiene. Education may change careers' attitudes and improve their skills. Management support and guidance, stakeholder engagement, policy documents, and increased resources may improve levels of oral hygiene provision in the community and institutionalized settings. Specially designed or adapted oral hygiene aids may improve the oral hygiene skills and careers of people with ID.

Author	Title	Method	Variable	Results
Shun-Te Huang, Su-Ju Huang, Hsiu-Yueh Liu, Chun-Chih Chen, Wen-Chia Hu, Yi-Chia Tai, Szu-Yu Hsiao	The Oral Health Status and Treatment Needs of Institutionalized Children with Cerebral Palsy in Taiwan	A cross-sectional study	the dental health status of children with cerebral palsy (CP) by determining their dental treatment needs in terms of different grades of disability, sex, and age	Promoting oral health education to parents, caregivers and nurses, strengthening prevention programs from childhood, and motivating dental practitioners to create a dental care system for this population with disabilities are urgently required.
John P. Morgan, Paula M. Minihan, Paul C. Stark, Matthew D. Finkelman, Konstantina E. Yantsides, Angel Park, Carrie J. Nobles, Wen Tao, Aviva Must	The Oral Health Status of 4,732 Adults with Intellectual and Developmental Disabilities	A retrospective study	● Information concerning oral health status ● Treatment needs of adults with intellectual and developmental disabilities (IDDs) ● Dental practices for inclusion in treatment guidelines ● Compensatory strategies to promote and protect the oral health of this vulnerable population	Management of oral health presents significant challenges in adults with IDD. Age, ability to cooperate with dental treatment, and type of residence are important considerations in identifying preventive strategies

Table 1. Design and Findings of Systematic Review Articles

Viewed from the standpoint of the need for healthcare, especially dental and oral health, the group of children with special needs is more in need than children in general (Report, 2018)(Guide, 2018). Children with special needs, because of various constraints on them, such as their less ability to take care of their mouth, have higher risk factors damaging teeth and surrounding soft tissues (Kencana, 2014)(Liu Z, 2014)(Blevins, 2011).The development process of the child requiring the fulfillment of food was good and adequate. Oral health maintenance is important as an effort to obtain sufficient food intake considering that the oral cavity is a masticatory apparatus. Special needs children, including children with Down syndrome and impaired motor nerve, are at risk of malnutrition and poor oral health (Guide, 2018)(Owens, 2011).

The development of Down syndrome children is different from that of normal children. Down syndrome children have delays and limitations in all areas of development so that they find it difficult to take care of themselves and tend to have a dependency ontheir surroundings, especially the parents and siblings (Triyanto, 2015)(Morgan, 2012).

Based on the data from RISKESDAS 2013, there are 300,000 cases of children who have Down syndrome in Indonesia. People with Down syndrome often have malocclusion. The mal occlusions found are often crossbite and open bite (Morgan, 2012)(Waldron, 2017). Children with Down syndrome are children who have the physical characteristics of a relatively short body, small head, and flat nose that resembles the Mongolian people (Thomas, 2011). Several factors such as congenital heart disease, severe hypotonia, biological or other environmental issues can cause delay in motor development and skills to support children with Down syndrom. Down syndrome is not a disease but a genetic disorder. Down syndrome is a condition of physical and mental retardation due to trisomy. The backwardness makes these patients cannot maintain their health. Oral conditions of people with Down syndrome usually

include constantly open mouth, as well as crack and fissureformation on tongue or lips. Fissure formation on the tongue can be severe and is a factor contributing to the occurrence of halitosis. People with Down syndrome have narrow palate with a hollow sharp look. This situation affects speech and masticatory function. Their eyes, nose, and mouth look dirty with broken teeth (Purohit, 2012)(Jones, 2000).

As the age increases, the oral health problems of people with Down syndrome also increase, so the need for oral hygiene care is increasing. Respondents with poor OHI-S have difficulties to communicate, making it difficult for parents to teach how to maintain healthy teeth and mouth to them (Lamba, 2015)(Gallagher, 2007).

The success of dental and oral care in children with Down syndrome is very dependent on the behavior of the parents. The parents have to instill discipline to the child in maintaining oral hygiene from an early age. When the child is accustomed to clean the teeth and mouth since he/ she is young, he/ she will be willing tobe taken to dental health services at any time.

4. CONCLUSION

The oral health of children with special needs is very dependent on the behavior of the parents where parents act as the closest people who constantly educate, train and give love to those children. In addition to parents, teachers at the school also play a very important role. This is because a teacher is a model for the students. Parents and teachers should provide trainingabout oral health and general body health in educating and teaching the children.

REFERENCES

Al-kotb H, Kefl RH. Effect of Training Teachers in Deaf and Mute school on Applying Oral Hygiene program on children with Hearing Disabilities. 2017;6(5):66–76.

Bertness J, Holt K. Promoting Oral Health in Schools: A Resource Guide. 2009. 56 p.

Bhambal A, Jain M, Saxena S, Kothari S. Oral health preventive protocol for mentally disabled subjects – A review. 2011;(I).

Blevins JY. Oral Health Care For Hospitalized Children. 2011;37(5):229–35.

Di S, Ypac SLB. Gambaran kebersihan gigi dan mulut pada anak penderita down syndrome di slb ypac manado. 2017;1(3):35–41.

Gallagher J, Scambler S. Disability and Oral Health. 2007;

Guide AR. Oral Health Services for Children and Adolescents with Special Health Care Needs.

Jones V, Leeman I, Lewis D, Blankenstein R. Oral Health Care for People with Mental Health Problems. 2000;

Kementerian Kesehatan. Pedoman Pelayanan Kesehatan Anak di Sekolah Luar Biasa (SLB) Bagi Petugas Kesehatan. Pedoman Pelayanan Kesehat Anak di Sekol Luar Biasa Bagi Petugas Kesehat. 2010;1–44.

Kencana IGS. Gigi Dan Mulut Pada Anak Berkebutuhan Khusus. 2014;2(2):260–5.

Kiswaluyo. Gambaran Kebersihan Gigi pada Siswa Sekolah Dasar Luar Biasa Bintoro Kabupaten Jember Tahun 2008. 2008;

Lamba R, Rajvanshi H, Sheikh Z, Khurana M, Saha R. Oral Hygiene Needs of Special Children and the Effects of Supervised Tooth Brushing. 2015;(5):30–5.

Liu Z, Yu D, Luo W, Yang J, Lu J, Gao S. Impact of Oral Health Behaviors on Dental Caries in Children with Intellectual Disabilities in Guangzhou , China. Int J Environ Res Public Health. 2014;11:11015–27.

Luiselli JK. Behavioral Health Promotion and Intervention in Intellectual and Developmental Disabilities.

Mathuri A, Aggarwal VP, Mathur A. Oral Health Status and Treatment Needs among Differently Abled Children. 2017;2(1):1–5.

Morgan JP, Minihan PM, Stark PC, Finkelman MD, Yantsides KE, Park A, et al. intellectual and developmental disabilities. J Am Dent Assoc [Internet]. 2012;143(8):838–46. Available from: http://dx.doi.org/10.14219/jada.archive.2012.0288

Owens J. Barriers to oral health promotion in the Republic of Ireland. 2011;39(April 2010):93–7.

Purohit BM, Singh A. Oral healthReport C. Oral Health Care for Children With Developmental Disabilities abstract. 2018;

Status of 12-year-old children with disabilities and controls in Southern India. 2012;1(3):330–8.

Thomas ER, Hall M, Owens J, Yesudian G, Hall M, Owens J, et al. Behavioral Health Promotion and Intervention in Intellectual and Developmental Disabilities. J Am Dent Assoc [Internet]. 2011;143(5):229–35. Available from: http://dx.doi.org/10.1016/S1991-7902(10)60012-8

Triyanto R. GAMBARAN STATUS KESEHATAN GIGI DAN MULUT PADA ANAK TUNAGRAHITA USIA 12-18 TAHUN DI SLB NEGERI WIDIASIH KECAMATAN PARI KABUPATEN PANGANDARAN Kesimpulan gambaran kebersihan gigi dan mulut pada anak tunagrahita di SLBN widiasih kecamatan parigi kabupaten pan. Indones oral Heal J. 2015;2(1):24–30.

Waldron C, C MP, Nunn J, Comiskey C, Guerin S, Mj C. Oral hygiene programmes for people with intellectual disabilities (Protocol). 2017;(4).

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Resilience and Happiness in Women

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Article Info
Keywords:
Happiness,
Resilience,
Woman,
Married.

Abstract
Every individual basically wants his life to be happy. Women who act as wives and mothers are also entitled to be happy. One of the determinants of happiness is the resilience of individuals facing various challenges or difficulties in life, also known as adversity quotient. This study examined the effect of individual resilience on subjective (subjective well-being) in married women. Happiness is a construct built by the satisfaction of life, the positive feelings, and the low negative feelings. The research approach used is quantitative approach with sampling technique by purposive sampling. Characteristic of this research sample is married woman with age of marriage ranged from 2-30 years. The scale used to measure resilience is based on the adversity quotient dimension, and to measure the happiness used SWLS and SPANE scales. The result of linear regression test on survival and life satisfaction showed that female resistance significantly influence to life satisfaction, linear regression test of endurance and happiness also obtained result that resilience have significant influence to happiness, and linear regression test of endurance and positive affects, significant to positive feelings, but different results were obtained on the linear regression test on resistance and negative feelings, the results showed that resistance did not significantly affect negative affects. The results of this study are expected to be psychoeducated in women to be resilient to obtain happiness.

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1. INTRODUCTION

Sustainable development or SDGs is one of the goals of sustainable national development that includes ensuring a healthy life and improving the welfare of people of all ages, achieving gender equality and empowering women and children (BPS, 2014). The achievement of a healthy life, in order to improve the welfare of women, is an important thing to do. Women as wives and mothers to their children have great roles and responsibilities in raising children, and taking care of the household. On the other hand, they are also responsible for their own personal happiness and in their marriage life. Through the happiness experienced and felt, seen from the behavior shown, there will be positive energy for yourself and the family environment. If women or mothers are happy, there will be a positive impact on the physical and psychological health of individuals and families. Although it is said that happiness belongs to everyone, many people cannot achieve a happy life. This is because they are not trying to gain that happiness. People who want to be happy should try to get it, as Diener (1984, 2009) argues, that happiness can be achieved when one tries to be happy, and they try to get it for themselves and others. Furthermore, it is said that happiness is subjective well-being that can be seen from the satisfaction of life, work, health and marriage. According to Aristotle (in Csikszentmihalyi 2014), happiness is the value of the soul's sincerity.Happiness or subjective well-being correlates with one's toughness. A tough person will achieve happiness or welfare in his life in overcoming difficulties he/ she encounters. A study conducted by Chin and Hung (2013) on employees related to the breach of contract psychological relationship with employee turnover, shows that adversity quotient moderates the relationship between

breach of contract psychology and employee turnover. Jureeporn and Kanjanakaroon (2012) in their research argued that adversity quotient is significantly related to empowerment. The results of Souria and Hasanirad (2011) study showed that psychological well-being was influenced by personal characteristics such as endurance and optimism, which were the variables that mediate the relationship between psychological endurance and wellbeing in 414 medical students. The aim of this study was to examine the influence of endurance and happiness variables in married women with linear regression test, linear regression test on endurance and life satisfaction, and linear regression test on endurance variable with positive affect and negative affect. The implications of this research are expected to be psychoeducation for women to be resilient in facing and overcoming difficulties in marriage life, thus gaining the happiness of life. Women who are tough in overcoming problems,especially in marriage life, will be able to bring happiness to themselves and their family, including their children. Women who are tough and happy are the milestone for the family and the nation.

According to Diener and Biswar (2008), happiness is "subjective well-being". In other words,it is a subjective matter, which is determined by the individual. Being happy indicates that the life goes well. Happiness includes pleasant emotions, joy, affection, and gratitude. A pleasant emotional atmosphere shows the harmony, the peace, the enthusiasm of pride, and satisfaction. According to Aristotle (in Csikszentmihalyi 2014), happiness is the value of the soul's sincerity. According to Meyer and and Diener (in Csikszenmihaly 2014), there are two contexts for understanding happiness. The first is as a personal trait, a permanently inclined disposition, in which the individual experiences well-being apart from external conditions. The second is the evaluation of subjective experience as the response to events in the environment. Csikszentmihalyi and Csikszentmihalyi (in Csikszenmihaly 2014) suggest the factors that affect happiness as subjective evaluation; 1) those associated with feelings, including cheerfulness and friendliness, 2) positive motivation, such as spirit, preparedness, endurance, 3) efficient thinking. Prieto, Diener, Tamir, Scollon, Diener (2005) argue that measurement of happiness is related to satisfaction and quality of life, evaluation of experience, and emotion-related responses to situations. Pavot and Diener (1993) assert that to measure happiness, SWLS life satisfaction scale may be used. It is a scale consisting of five items: [1] I feel that my life is approaching my ideal life. [2] I feel the atmosphere of my life is very pleasant. [3] I am satisfied with my life. [4] So far, I am getting what I want in life. [5] If I could change my life, I would still choose to be me.

According to Stolz (2000), adversity quotient is the ability of a person to endure difficulties, overcoming difficulties to surpass his expectations and survive. Roosseno (2008) defines Adversity Quotient as a toughening ability that is how well a person endures the difficulties he/ she experiences and how well is he/she inovercoming adversity. Adversity Quotient has three conceptual forms to understand and increase happiness. Both adversity quotient are the response in the face of adversity, and third is the whole way of responding and overcoming difficulties which will increase personal growth (Stolz 2005). Adversity Quotient is effectively used in the realm of working relationships, family, enterprise, group, and culture (Stoltz 2005). Stoltz (2000) proposes that adversity Quotient has 4 dimensions, i. e. Control, Ownership, Reach, and Endurance known as CORE model. Control is how often one is able to control a difficult situation or event. Someone that has high score on this dimension issomeone who actively tries to overcome the difficulties he/ she encounters and changes difficult situations into opportunities. Ownership is the extent to which a person is responsible for improving oneself in a situation at hand. A high score on this dimension indicates the individual is responsible for the actions that have been done and learned from the situation. Reach is the extent to which a person feels good or bad events affecting his life. A high score on this dimension shows that the individual tends to overcome difficulties and see problems as specific and limited. Endurance is the perception of how good or bad events experienced are a temporary situation. A high score on this dimension shows an individualwho perceives difficulties as something that are temporary and they are optimistic and have energy in overcoming adversity. A high adversity quotient score on the CORE model, by summing up overall, indicates that the individual is psychologically more resilient in overcoming difficulties encountered.

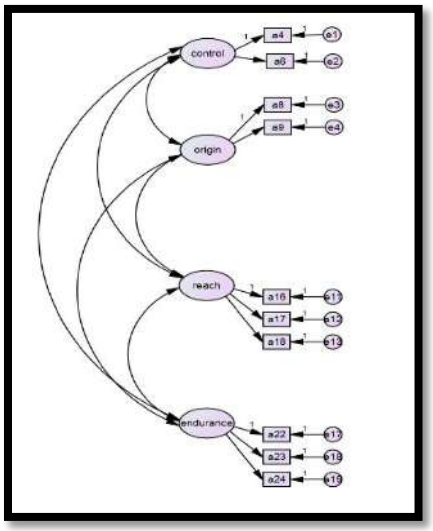
2. RESEARCH METHODS

This study is a quantitative research that aims to examine the influence of resilience to the happiness of married women. This study tested four hypotheses namely: [1] Resilience has an effect on life satisfaction; [2] endurence affects happiness; [3] Resilience affects positive affects; [4] Resilience affects negative affects.

To measure women's resilience, a scale of resilience based on the adversity quotient dimensions of Stoltz, i. e. C (control), O (ownership), R (reach), and E (endurance) was used. As for measuring the happiness,the adapted forms of SWLS scale (satisfaction with life scale) of Diener, Emmons, Larsen and Griffin (1985) and SPANE (scale for positive and negative experience) of Diener, Wirtz, Tov, Kim-Prieto, Choi, Oishi, and Biswas-Diener (2010) were used. The sampling technique used to select the sample was purposive sampling technique, with certaincriterion for the participants, i. e. women who have been married for at least 2 years. The study involved 192 married women in Jakarta and its surrounding areas.

Some scales were used in this research, namely the scale of individual resilience, SWLS, and SPANE. Thescales were tested with feasibility and reliability test, item difference test, and CFA test (confirmatory factor analysis). The individual resilience scale had an internal consistency value of 0.796, meaning that the scale was reliable. Based on the item difference power test, there were 20 different power items from 24 items, moving from 0.250 – 0.575. CFA individual resilience scale yielded a 0.097 probability value,meaning that the CFA was suitable (p> 0.05). Based on the CFA, it was also known that the number ofitems that had good construct validity was 10 items, i. e. C two items (item 4 and 5), O two items (item 8 and 9), R three items (item 16,17 and 18), and E three items (item 22,23, and 24). The CFA scale of individual resilience can be seen in Figure 3.1.

The happiness scale, which comprises the life satisfaction scale of SWLS, and the SPANE feeling scale were also tested with reliability test, the difference of item test, and CFA test. Based on the reliability test, it is known that SWLS had an internal consistency of 0.816. SPAN for positive affects had an internal consistency of 0.830. Meanwhile, SPANE for negative affects had an internal consistency of 0.908. All three showed a score of above 0.7, meaning that oth SWLS and SPANE were a reliable measuring tool. In addition, the item difference power test showed that all five SWLS scale ranges were moving from 0.326 - 0.730. Similarly, SPANE for positive and negative affects all of which differed from 0.257 - 0.729 for positive affects SPANE and 0.670 - 0.801 for negative affects SPANE. The CFA happiness scale showed a probability value of 0.741 (p> 0.05), meaning that the CFA of this scale was suitable. In addition, based on CFA results on the happiness scale, it is known that there were 11 items with good construct validity, namely three items (item 1, 2 and 3) of life satisfaction (LS), four items (item 1, 3, 5 and 6) of positive affects (PA), andfour items (item 3, 4, 5 and 6) of the negative affects (NA). CFA of happiness scale can be seen in Figure 3.2.



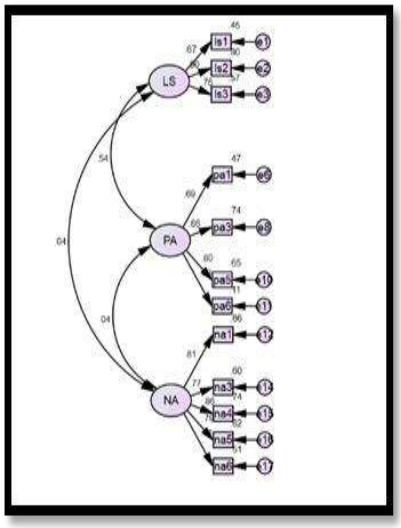


Figure 3.1 CFA Individual Resilience Scale

Figure 3.2. CFA Happiness Scale

3. RESULTS AND ANALYSIS

a. Descriptive Data

Table 4.1 Participant Descriptive Data

Marital Age	Number of children	Education	Occupation	Position	Income	Number of Participants	percentage
2-5 year						42	21.87 %
>5-10 year						34	17.70 %
>10-15 year						31	16.14 %
>15-20 year						29	15.10 %
>20-25 year						37	17.27
>25 -30 year						19	9.89 %
	1-2					129	67 %
	3					49	25.52 %
	4-5					14	7.29 %
		Doctorate				1	0.52 %
		Master				19	9.89 %
		Bachelor				83	43.22 %
		Diploma				17	8.85 %
		Senior High School				72	37.5 %
			BUMN			6	3,12 %
			Private			47	24.47 %
			Civil Servants			43	22.39 %
			Teacher			12	6.25 %
			Housewife			84	43%
				Director		1	0.52 %
				Manager		4	2.08 %
				Staff		91	47.39 %
				Teacher		12	6.25 %
				Housewife		84	43 %
					>50.000.000	1	0.52
					>25.000.000	2	1.04 %
					10 15 juta	27	14.06 %
					5 – 10 juta	21	10.93 %
					4 - 5 juta	49	25.52 %
					< 3 juta – 3 juta	92	47.91 %

The age of marriage of study participants varied from 2 to 25 years of marriage. Participants whose marriage age were 2 -5 years old were the majority of the participants in the study, which were as many as 42 participants with a percentage of 21.87%.the number of participants with 5-10 years of marriagewas 34 participants, with a percentage of 17.70%. The number of participants with 10 -15 years of marriage was 31 participants, with a percentage of 16.14%. The number of participants with 15-20 years of marriage was 29 participants, with a percentage of 15.10%. The number of participants with 20-25 years of marriage was 37 participants, with a percentage of 17.27%. Finally, the number of participants with 25-30 years of marriage was 19 participants, with a percentage of 9.89%.

The descriptive data showed that the number of children of the participants in this study varied from one to five children. There were 129 participants who had 1-2 children with the highest percentage of 67%, 49 participants with 3 children (25.52%), and 14 participants with 4-5 children (7.29%).

From the descriptive data, the educational background of the participants varied from High School to Doctoral Degree.The number of participants with Bachelor's degree was 83 with a percentage of 43.22% which became the majority of the participats involved in this research.The number of participants with High School education was 72 with a percentage of 37.5%.The number of participants with Master's degree was 19 participants with a percentage of 9.89%.The number of participants with Diploma degree was 17 participants with a percentage of 8.85% and The number of participants with Doctoral degree was 1 participant with a percentage of 0.52%.

The descriptive data showed that the work background of the participants also varied from housewiveswhich were as much as 84 participants with a percentage of 43%, private employees with a total of 47 participants(24.47%), civil servantswith a total of 43 participants (22.39%), teacherswith a total of 12 particiants(6.25%) and pBUMN employees with a total of 6 participants (3.12%).

The descriptive data showed thevaried job positions of the participants, including84 housewife participants with a percentage of 43%, 91 staff in private and public companies with a percentage of 47.39%, 12 teachers with a percentage of 6.25%, 4 manager participants with a percentage of 2.02%, and 1 participant with director position with a percentage of 0.52%.

The descriptive data also showed varied income of the participantsfrom <3 to 3 million rupiah, consisting of 92 participants who had an income of lower than 3 million rupiah with a percentage of 47.91%,49 participants who had an income of 4-5 million rupiah with a percentage of 25.52%, 21 participantswho hadan income of 5-10 million rupiah with a percentage of 10.93%, 27 participantswho hadan income of 10-15 million rupiah with a percentage of 14.06%, 2 participants who had an income of 25-40 million rupiah with a percentage of 1.04%, and 1 participantwho had an income above 50 million rupiah with a percentage of 0.52%.

b. Hypothesis Results

Table 4.2 Regression Results

Variable	R	R^2	F	Sig.	T	Sig	Decision
AQ – life Satisfaction	0,419	0,175	40,390	0,000	6,355	0,000	Hypothesis 1 Accepted
AQ – Happiness	0,456	0,208	49,950	0,000	7,068	0,000	Hypothesis 2 Accepted
AQ – PA	0,374	0,140	30,955	0,000	5,564	0,000	Hypothesis 3 Accepted
AQ – NA	0,122	0,015	2,875	0,092	1,690	0,092	Hypothesis 4 Rejected

The results of hypothesis test 1 show that individual resilience had an effect on woman's life satisfaction which was equal to 17.5% with an F value of 40.390 with p <0.005 and t value of 6.355 with p <0.005. This means that the first hypothesis stating that there is a significant effect of resilience on the satisfaction of a woman's life is accepted. The results of this study indicate that when women are able to survive, then they will feel satisfied with their lives. It is because with perseverance they can achieve their dream of being a good wife and motherbecause, for women, being a good wife and mother is one of the dreams that must be achieved. This is in line with the results of research by Harvey (2007) which suggests that women are independent and resilient in overcoming difficulties and interpreting health and welfare. The results of research conducted by Tianqiang, Dajun, Jinliang (2015) found that the resilience of individuals in overcoming difficulties is related to mental health. It is also said that gender moderates endurance and mental health.

The results of hypothesis test 2 show that individual endurance affectedhappiness which was equal to 20.8% with an F value of 49.950 with p <0005 and t value of 7.068 with p <0,005. This means that the fourth hypothesis stating that there is a significant effect of resilience on the happiness of women is accepted. Thus, if a woman is able to control the circumstances, to take responsibility for her actions, to limit the effects of a specific problem, and to perceive that the problem is a temporary event, then the

woman will be happy. This is similar to Shmotkin's (2005) idea that happiness is a sweet side of someone who is able to overcome difficulties.

The results of hypothesis test 3 show that the individual endurance affectedpositive affects which was equal to 14%with an F value of 30.955 with p <0.005 and t value of 5.564 with p <0.005. This means that the second hypothesis stating that there is a significant effect of resilience on woman's positive affects is accepted. When women are able to survive and face the problems of life strongly, then they will feel positive feelings. The results of research conducted by Cohn, Frederickson, Brown, Mikels, Conway (2009) shows that the resilience of individuals becomes a factor that mediates positive emotions and life satisfaction. It further shows that people feel happiness and satisfactionnot because they feel better, but because of the process of change in developing resources for a better life. Bajaj and Pande (2016), in their research found that endurance is one factor that mediates mindfulness and life satisfaction, as well as resilience. In other words, resilience is a factor that mediates mindfulness, positive affects and negative affects

The results of hypothesis test 4 show that individual endurance had no significant effect on women's negative affects. The magnitude of R2 was 0.015,meaning that it had only a small effect of 1.5% with p> 0.005. This means that the third hypothesis that says there is a significant effect of resilience to a woman's negative affective is rejected. This means that in everyday life, not many women faced various problems frequently. These problems could cause women to experience a variety of negative emotions. For women who can survive, these negative feelings persist. This can be because women are reported to have more negative feelings than men (Costa, Zonderman, McCrae, Cornoni-Huntley, Locke, & Barbano, 1987; Fujita, Diener, & Sandvik, 1991).

Table 3.3 Empirical Rates of Married Female Respondents

Variabel	Empirical Mean	Category
Resilience	46,20	High
Life Satisfaction	22,82	High
Positive Affect	27,23	High
Negative Affect	23,53	Medium

The empirical results show that the resilience of the women who participated in the study was in the high category. Participants in this study appeareds to have resilience by feeling confident that they were able to overcome difficulties they encountered, and tended to be persistent. They were able to sort through problems so as to overcome difficulties. They considered the difficulties they faced as temporary problems. They overcametheir difficulties not by blaming other people or external factors. This shows that the participants were individuals who were able to survive whenfacingproblems and that madethem happy and satisfied. When a woman gets married, then the number of the problems she faceswill keep increasing.

Problems can make individuals feel negative feelings. This is also shown in the participants of the study, in which the mean empirical results of the negative affects of the participants were in the moderate category. This means that most participants still experienced negative feelings in their lives, but this was not something that preventedthem to feel happiness. Seery, Holman and Silver (2010) state that individuals who experience various challenges and difficulties in their lives will make them tough, and that willhave impact on their mental health and welfare. The average score of positive affects of the married women participants was in the high category. This means that although they could not avoid problems, women could also feel positive feelings. The empirical result of female life satisfaction in this study was 22.82 and was in the high category. This shows that most participants assume thattheir lives were very satisfying.

4. CONCLUSION

Based on the background issues that have been raised in the introductory chapter, the resilience of married women in overcoming difficulties affected their satisfaction and happiness. From the data obtained and hypothesis tested by linear regression, it is evident that three out of the four hypotheses are accepted and only one hypothesis is rejected. From the discussion in the previous chapter it can be concluded that the resilience of the married women affected their life satisfaction. Hypothesis 1 which states that resilience has an effect on the satisfaction of life isaccepted. Hypothesis 2 which states that resilience affects the happiness is accepted. Hypothesis 3 which states that resilience affects positive affects is accepted. From the results of the linear regression test on resilienceand negative affects, it is found thatresilience has no effect on negative affects,which means that hypothesis 4 stating that resilience affects negative affects is rejected.Based on mean score of resilience which is categorized as high, it can be concluded that this research has high adversity quotient. High mean empirical score of life satisfaction indicates that the participants had life satisfaction and felt prosperous. High mean empirical score of positive affects indicates that the respondents felt positive affects in their life. While the mean score of negative affects is categorized as medium.The results of this study, which shows that the resilience of women to overcome difficulties makes them strong that, in return, also makes them happy and prosperous. Thus, the results of this study can be one of the considerations for psychoeducation and counseling in women, in empowering women to bephysically and mentally healthy.

ACKNOWLEDGEMENTS

The completion of this journal writing is thanks to the help of various parties. For that, we express our gratitude to various parties who have given assistance in the implementation of the research and the participants who have filled out the research questionnaire.

REFERENCES

Bajaj, B.; Pande, N.;"mediating role of resilience in impact to mindfulness on life satisfaction and affect as indices of subjective well-being," Individual and Personality Difference, vol.93, pp. 63-67, April, 2016.

BPS,; "Kajian Indikator Sustainable Development Goals (SDGs)" Publikasi, 07330.1413, Katalog BPS : 3102020, 2014.

Chin, P.; Hung,M.; "Psychological contract breach and turnover intention, the moderating roles of adversity quotient and gender," *Social Behavior and Personality, An International Journal*, vol41, pp 843-860,2013.

Cohn, M,A.; Frederikson, B.L.;Brown, S.L.; Mikels, J.A.; dan Conway, A.M.;"Happiness unpacked, positive emotions increase life satisfaction by buliding resilience," vol. 9.3,pp361-368, 2009.

Costa, P. T.; Zonderman, A. B.; McCrae, R. R.; Cornoni-Huntley; J.; Locke, B. Z.; & Barbano, H. E.; "Longitudinal analyses of psychological well-being in a national sample," stability of mean levels, *Journal of Gerontology*, vol 42, pp.50–55,1987.

Csikzentmihalyi, M.; ".Flow and the foundations of positive psychology,"ISBN 978-94-017-9088-8, DOI 10.1007/978-94-017-9088-8, 2014.

Diener, Ed.; "The science of well-being"; e-ISBN 978-90-481-2350-6. DOI 10.1007/978-90-481-2350-6, 2009.

Diener, Ed.; Biswas, R.; "Happiness: unlocking the mysteries of psychological wealth," Publishing Blackwell Ltd, ISBN 978-1-4051-4661-6; 2008.

Diener, Ed.;Wirtz, D.; William, T.;Prieto,C,K.; Choi, D,W.;Oishi, S.;Diener,R.B.; "New well-being measures, Short scales to assess flourishing and positive and negative Feelings,"vol97,issue.2,pp.143-156, Juni 2010

Diener, Ed.; “Subjective wellbeing,” Psychological Bulletin: Vol.95. no.3, pp542-575, 1984.

Fujita, F.; Diener, E.; & Sandvik, E.;. “Gender differences in negative affect and well-being,” the case for emotional intensity, Personality Processes and Individual Differences, vol.61, pp.427–434.1991.

Havey,D; “Understanding Australian rural women’s way achieving health and wellbeing ametasyntesis of the literature. Rural and Remote Health”, vol 7.issue4,823, Oktober 2007.

Ifeacgwazi, M, C.; Chukwuorji,C,J.; Zacchaeu, A, E.; “Alienation and Psychological well-being, Moderation by resilience”. Maret 2014.

Prieto, K.C.; Diener, ED.; Tamir, M.; Scollon, C.; Diener, M.; “Integrating the diverse definition of happiness, the time sequential framework of subjective well-being,”*Journal of happinessstudies,* vol.6, pp.261–300, Sepember 2005.

Pavod, W.; Diener, Ed.; “Review of the satisfaction with life scale, *psychological assessment*.”vol. no.2, pp164-172,1993.

Roosseno.; “Jembatan dan menjembatani”. Jakarta, Yayasan Obor Indonesia, 2008.

Seery,M,D.; Holman,E,A.; Silver, R,C. “Whatever does not kill us, Culmulative lifetime adversity, vulnerebility, and resilience,” Journal of Personality and Social Psychology, vol.99, no.6, pp.1025-1041, 2010.

Shmotkin, D,; Happiness in the face of adversity,“reformulating the life dynamic and modular base of subjective well-being, *Review of general psychology*,vol.9.no4, pp.291-325, 2005.

Souri,H,;Hasanirad,T; “Relationship between resilience, optimism and psychological wellbeing in students of medicine,” Procedia Social and Behaviour Science, vol.30.pp1541-1544,2011.

Stoltz,P,G.; Adversity quotient, “mengubah hambatan menjadi peluang,” Terjemahan Hermaya, T.; editor Hardiwati, Y.; Jakarta, Penerbit PT Grasindo, 2005.

Stoltz,P,G.; Adversity quotient,; “mengubah hambatan menjadi peluang,” Terjemahan Hermaya, T.; editor Hardiwati, Y.; Jakarta, Penerbit PT Grasindo,2000.

Tianqiang,H.;Dajun,Z.;Jinliang,W.;” A meta-analysis of the trait resilience and mental health,” Personal Individual Deference, vol76,pp18-29,April 2015.

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Health Locus of Control and Health-Related Quality of Life In Medical Students Who Smoke

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Article Info

Keywords:
Health Locus of Control,
Health-Related Quality of Life,
Medical Student,
Smoking Behavior,

ABSTRACT

Medical students will be agents of change for public health in the future. However, we easily may find medical students who smoke. One of the factors that may give influence to health behavior is the individual's belief that can affect their health, which is called health locus of control. Furthermore, healthy behavior may determine quality of life in individual, especially the concept about Health-Related Quality of Life. This study was aimed to investigate about relationship between health locus of control and Health-Related Quality of Life among medical students who smoke. There were 128 participants in this study (male=89 and female=39). The result showed that there was a negative correlation between chance dimension of health locus of control and health related quality of life (r = - 0.240 ** p = 0.006 <0.05). This result suggested that the higher the score of chance dimension, the lower the individual's judgement about their health-related quality of life.

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1. INTRODUCTION

Smoking is an unhealthy behavior. However, only a few people can quit smoking completely. On the other hand, smoking has several negative impacts, such as suffering from various diseases (respiratory disease, cardiovascular disease, lung cancer, and stroke); affected economic status (especially for families with middle to low social economic status). Data shows that 69% of households in Indonesia have expenditure allocation for cigarettes (Susanti, 2014)(Pardede, 2017). Indonesia is one of the countries with the highest number of smokers in Southeast-Asia with 51.1% of the total population (Simanjuntak, 2015). The number of smokers in Indonesia continuously rises from 34.2% in 2007 to 36.2% in 2013 (Kania, 2017). The total number of male smokers is 56,860,457, while the number of female smokers is 1,890,135 (Maharani, 2015). Based on a survey in 2015, the number of smokers whose age was15-24 years old was 19.55%of the total smokers (Kania, 2017). Tristanti (2016) states that, generally, teenage boys can consume 11-20 cigarettes per day and some even more than 20 cigarettes per day. Smoking behavior among college students are mainly caused by curiosity, peer influence and masculinity image (Perwitasari, 2006).

In the future, medical students are expected to be health practitioners as well as agents of change in public health. However, some students majoring health sciences, such as medicine, also have smoking behavior. According to a survey in 2006 on students majoring in health science who smoked, 8.6% of them were smokers and the number continuously rose to 18.3% in 2013 (Larasati & Coralia, 2016). Pramudiarja (2012) conducted a study on smoking behavior in three Faculties of Medicine (from different universities) in Yogyakarta, the results showed that 25% of medical students were active smokers, and the number of male smokers in the faculty was above 35%. In addition, 50% of the medical students in those three faculties had tried to smoke cigarettes. This contradictive condition becomes a concern because the awareness of health practitioners in smoking behavior has an important role in helping

others to quit smoking (Xiang et al., 1999). Therefore, medical students become a major target in tobacco prevention program because they are expected to persuade smokers in surroundings to quit smoking (Vakeflliu et al., 2002).

There are several factors that cause people to smoke, which are divided into internal and external factors. The combination of these two factors can be represented by psychological concept called Locus of control. This concept describes an individual's belief about sources that can control an event in his life, whether derived from himself (internal) or from external factors (Perwitasari, 2006). Individual with internal dimensions of Locus of Control usually believes that it is himself who influences his behavior, while an individual with external dimensions of Locus of Control has the belief that another aspect has a role in influencing his behavior. In health behavior context, this concept develops to another concept called health locus of control (HloC). Wallston, Wallston & DeVellis (1978) suggested that the concept of health locus of control describe show an individual perceives which aspect controlshis/ her health, either internal dimension (him/ herself), chance dimension (fate, luck), or powerful others (significant person such as family, friend or health practitioners).

Farida (in Mandasari, 2012) stated that internal dimensions of HloC in adolescents who smoke were low, while chance and powerful others dimension showed higher scores compared to those of non-smokers. In addition, Fadiha & Rahmatika (2016) suggested that there was no significant difference in the three dimensions of Health locus of control in female and male adolescents who smoked. Furthermore, Istika & Rahmatika (2016) stated that there was a relationship between the three dimensions of the Health locus of control with Health Belief in adolescents who smoked.

Although there are several studies about health locus of control in smoking behavior in Indonesia, only few literatures can be found about the relationship between health locus of control and health-related quality of life (HRQOL), especially ones that are related to smoking behavior. People who can determine their health locus control are more likely to improve their healthy behavior and avoid unhealthy behavior that will affect their quality of life (Norman, Bennett, Smith, Murphy, 1998)(Adliyani, 2015). Research conducted by Lima, Borim and Azevedo (2014) shows that smoking has a negative relationship with health-related quality of life, meaning that smoking behavior can reduce the quality of life. The results of the research may also enrich insight on this issue which can be used to make policy about smoking behavior that will lead to improved quality of life. Hence, this research aimed to investigate the relationship between Health locus of control and Health-related quality of life in medical students who smoke.

2. RESEARCH METHOD

This research is quantitative research with associative research design that correlates health locus of control and health-related quality of life in medical students who smoke.

Participants

Medical students aged 18 to 25 years old who smoked were collected with non-probability sampling technique, called incidental sampling. All of the participants lived in Special Capital City District of Jakarta (DKI Jakarta).

Measurement

Multidimensional Health locus of control (MHLC) form A from Wallston & Wallston (1978) which had been adapted into Indonesian Language was used to measure Health locus of control in this study. The dimensions were internal health locus of control, chance health locus of control and powerful other health locus of control. MHLC form A had been adapted to Indonesian language with coefficient reliability score of 0.607 (internal), 0.756 (chance), and 0.745 (powerful others). All items of MHLC are valid to measure health locus of control (Fadiha & Rahmatika, 2016)(Istika & Rahmatika, 2016).

EQ-5D-5L (Indonesian language) was used to measure health-related quality of life. This scale measured the quality of life which was related to individual's health and daily functioning. There were 5 dimensions of this measuring tool, i. e. mobility, self-care, daily activities, pain or discomfort and depression or anxiety. The measurement used a 5-choice-scale with the following options: 1 (not difficult), 2 (a little difficult), 3 (quite difficult), 4 (very difficult) and 5 (unable to perform the activity)(Reenen & Janssen, 2015). EQ-5D-5L had been adapted to Indonesian Language and all the items were valid (Purba, Hubfeld, Iskandarsyah, Fitriana, Sadarjoen, Passchier & Busschbach, 2016).

Statistical analysis

The data was analyzed by using Spearman analysis technique because the distribution of the data was not normal.

3. RESULTS AND ANALYSIS

3.1. Demographic characteristics

The total number of the participants of this study was 128 participants, which consisted of 89males(69.5%) and 39 females (30.5%). The age of participants ranged from 18 to 25 years old (M = 1.3; SD = 0.462). The smoking period of 64 participants (50%) was less than 3 years. A total of 92 participants (71.9%) consumed 1-10 cigarettes every day. Furthermore, the number of participants who reported that their close friends usually smoked around them was 74 participants (57.8%).

3.2. Correlation

The distribution of the data was not normal. Thus, the data was analyzed withSpearman correlation analysis technique. The results showed that there was a negative and significant correlation between the chance dimension of health locus of control and health-related quality of lifeby using EQ-5D-5L (r = - 0.240 **, p <0.05). In addition, there was a negative and significant relationship between the chance dimension of health locus of control and health-related quality of life by using EQ VAS (r = - 0.205 *, p <0.020). On the other hand, the internal and powerful other dimensions of HloC had no significant correlation to health-related quality of life.

3.3. Supplementary Analysis

The further analysis for this study was to investigate whether data from demographic characteristics would show different score to HloC and Health-Related Quality of Life. The result showed that there was a difference between the scores of health-related quality of life based on the amount of cigarettes' consumption per day. Subjects who smoked 1 to 10 and 11 to 20 cigarettes per day had higher score of health-related quality of life compared to those who smoked more than 20 cigarettes per day (p<0.05).

3.4. Discussion

In this study, there was a significant correlation between chance dimension of health locus of control and health-related quality of life in medical student who smoked (r = - 0,240 **, p = 0,006 <0,05). In addition, score of EQ VAS measuring instrument also showed a significant correlation between the chance dimension of health locus of control and health-related quality of life (r = - 0,205 *, p = 0,020 <0,05). The results indicated hat the higher medical students' perception that fate or luck was the one that controlled their health, the lower the score of their quality of life. The same result was shown in a study conducted by Georgiades (1996) indicating that individuals who smoked had a belief that their health depended on fate. In this study, medical students had confidence that their health was determined by luck rather than by themselves. Medical students who smoked tended to ignore their health when they perceived that chance dimension (fate, luck) was the aspect that determined their health. This condition affected their effort to stay healthy because they did not perceive themselves as the ones who could control their own health, and it might lead to their judgement about health-related quality of life.

On the other hand, medical students were assumed to have knowledge about the negative impacts of smoking. However, they still smoked and did not perceive themselves as the ones who could control their own health. Chotidjah (2012) stated that there was a correlation between smoking behavior and external health locus of control, but there was not any correlation between smoking behavior and knowledge about cigarettes.

Another finding of this study showed that there was not any correlation between internal dimension of health locus of control and health-related quality of life in medical student who smoked (r = - 0,167, p = 0,060> 0,05). The score of internal dimension of HloC determines whether people will have a healthy behavior or not that it will relate to their health-related quality of life. However, the results of the study indicated that the students had low score of internal dimension of HloC which might be the reason why the medical students still smoked despite their knowledge about health.

This study also found that there was not any correlation between the powerful others dimension of HLoC and HRQoL in medical students who smoked (r = - 0.155, p = 0.081> 0.05). Powerful others were described as significant person/people perceived to be the one(s) who took control of their health. The significant others can be friends, family, partner or health practitioners. The data from demographic characteristics showed that medical students who smoked had significant person(s) who also smoked, including friends (57.8%), family (4.7%) and boyfriend/ girlfriend/ spouse (2.3%). Nevertheless, it can be assumed that medical students' HloC was affected by their social environment. In addition, social environment can be one of the factors that affect the quality of life (Pradono, Hapsari, and Sari 2009). However, this study showed different result. Thus, there is a need for further analysis to explore more about correlation between these two variables in medical students who smoke.

This study investigated how demographic characteristics might result in different scores, either in HloC, or HRQoL. The result showed that there was a difference inHRQoL scores based on the number of cigarettes' consumption per day, whereas participants who smoked 1-10 cigarettes per day had higher score of HRQoL than those who smoked more than 20 cigarettes per day. Participants who smoked 11-20 cigarettes per day also had a higher score of HRQoL than those who smoked more than 20 cigarettes per day. Similar research result was found in Becona (2013), which showed that a person who consumed more than 25 cigarettes per day had lower score of HRQoL.

The weakness of this study was the lack of data used since it was difficult to get participants. It is because most medical students did not want to admit that they consumed cigarettes. In addition, there were some incomplete questionnaire responses. Therefore, the researchers did not get much data in this study. For further research, it is suggested to add other methods, such as interview, to explore more about health locus of control and health-related quality of life.

4. CONCLUSION

To conclude, only chance dimension from HLoC had negative correlation to HRQoL (r = - 0.240 **, p = 0.006 <0.05). This result can enrich knowledge that is useful for finding out the best way to promote healthy behavior among medical students who smoke by increasing their internal strength in order to make them believe that they are the best agent to control their own health. For further research, mixed method (for example, interview and questionnaire) to collect the data is recommended. It is because, in this study, it was difficult to find medical students who voluntarily admitted that they smoked.

REFERENCES

Abdi, G. "45 Persen Remaja Indonesia Usia 13-19 Perokok". Diunduh dari http://health.liputan6.com/read/214 2904/45-persen-remaja-indonesia- usia-13-19-perokok pada 07 Januari 2017. 5 Desember 2014

Adliyani, Z. "Pengaruh Perilaku Individu terhadap Perilaku Sehat". Vol 4 No 7. 2015.

Akla, M. "Hukum rokok menurutMuhammadiyah dan NU*"*. Skripsi.Yogyakarta: Universitas Islam Negeri. 2010.

Alamsyah, R.M. "*Faktor-FaktorYang Mempengaruhi Kebiasaan Merokok Dan Hubungannya Dengan Status Penyakit Periodontal Remaja Di Kota Medan Tahun 2007". Tesis*. UniversitasSumatra Utara. 2009

Alreck, P., & Sattle, R. "*The Survey Research Handbook*". Salisbury University. 2004.

Arifin, Z & Rahayu, I.T. "Hubungan Antara Orientasi Religius, *Locus Of Control* Dan *Psychological Well-Being* Mahasiswa Fakultas Psikologi Universitas Islam Negeri Maulana Malik Ibrahim Malang". *E-journalUIN Malang.* 2012.

Azila, A.A. "Gambaran KualitasHidup Pasien Diabetes Mellitus Tipe 2 Di Poli Interna RSD Dr. Seobandi Jember". *Skripsi*.Universitas Jember. 2016.

Azwar, S. "*Metode Penelitian"*. Yogyakarta: Pustaka Pelajar. 2012.

Baits, A.N. "*HukumRokok Dalam Islam"*. Diunduh dari https://konsultasisyariah.com/1375 3-hukum-rokok-dalam-islam.html pada 13 Juni 2017. 24 Februari 2013

Becona, dkk. "Smoking habit profi le and health-related quality of life". *Psicothema.*DOI : 10.7334/psicothema2013.73. 2013.

Chen, P.L., Huang, W.G., Chao, K.Y. "Susceptibility to initiate smoking among junior and senior high school non-smokers in Taiwan". *Preventive Medicine (49),* 58-61.DOI: 10.1016/j.ypmed.2009.04.013. 2009

Chotidjah, S. "Pusat Pengetahuan Rokok, Pusat Kendali Kesehatan Eksternal Dan Perilaku Merokok". Vol 16, No 1. 2012.

Dimsdale, J. E. "*Quality of life inbehavioral medicine research"*. NewJersey: Lawrence Exlbaum Associates. Publishers. 1995

Fadiha, I. S & Rahmatika, R. "Perbedaan Helath Locus of Control pada Remaja Laki-laki dan Perempuan". *Prosiding ForumIlmiah Psikologi Indonesia*:Universitas Tarumanegara. 2016

Fikriyah, S & Febrijanto, Y. "Faktor-Faktor yang Mempengaruhi Perilaku merokok pada Mahasiswa Laki-laki Di Asrama Putra". Vol 5, No 1. 2012.

Georgiades, I. "Acculturation, gender, health locus of control, and generational status as predictors of smoking behavior among Greek Americans". *Dissertation*. New York: Fordham University. 1996.

Istika, F.F & Rahmatika, R. "Hubungan antara *Health Locus ofControl* dengan *Health Belief* PadaRemaja yang Merokok". *ProsidingForum Ilmiah Psikologi Indonesia*:Universitas Tarumanegara. (2016).

Kania, D. "*Menyedihkan! Jumlah Perokok di Indonesia Meningkat*". Diunduh dari http://lifestyle.okezone.com/read/20 17/05/12/481/1689319/menyedihka n-jumlah-perokok-remaja-di-indonesia-meningkat, pada 30 Agustus 2017. 2017.

Kristina, S.A., Endarti, D., Widayanti, A.W., Widiastuti, *M. "Health-related Quality of Life Among Smokers in Yogyakarta Province, Indonesia'*. ISSN : 0975 1556.2015.

Larasati, H & Colaria, F. "Studi Deskriptif Mengenai Health Belief pada Mahasiswa Perokok Fakultas Kedokteran Universitas Islam Bandung". *Prosiding Psikologi*. ISSN: 2460-6448. 2016.

Lima, M.G., Borim, F.S.A. and de Azevedo Barros, M.B. “Smoking and Health-Related Quality of Life (SF-36). A Population-Based Study in Campinas, SP, Brazil”. Health, 6, 1539-1548. http://dx.doi.org/10.4236/health.20 14.612189. 2014.

Maharani, Dian. “Wanita ini kehilangan Suara karena Jadi Perokok Pasif”. Diunduh dari http://health.kompas.com/read/2015/05/25/083000923/Wanita.Ini.Kehil angan.Suara.Karena.Jadi.Perokok.P, pada 16 Oktober 2016. 25 Mei 2015

Maharani, Dian. “Jumlah Perokok Indonesia 10 Kali Lipat Penduduk Singapura”. Diunduh dari http://health.kompas.com/read/2015/06/03/110000223/Jumlah.Perokok.Indonesia.10.Kali.Lipat. Penduduk.Singapura, pada 28 Oktober 2016. 03 Juni 2015

Mandasari, Yulita. “Hubunganantara Health Locus of Control dan Perilaku Asertif pada Remaja yang Merokok”. *Skripsi*. UniversitasGunadarma. 2012

Maulidya, P. “*Hasil Survei: 45 Persen Remaja Indonesia Usia 13 - 19 Tahun Sudah Merokok*”. diunduh dari http://surabaya.tribunnews.com/2016/08/29/hasil-survei-45-persen- remaja-indonesia-usia-13-19-tahun- sudah-merokok, pada 5 Maret 2017. 29 Agustus 2016.

Minoki, A.. Asy Syaafii. “*Zat yang Maha Menyembuhkan*”. Diunduh dari https://muslim.or.id/8489-asy-syaafii-zat-yang- mahamenyembuhkan.html. pada 28 Juli 2017. 29 Februari 2012

Moshki, M., Fazlollah G., Ebrahim H., & Parviz A. “Validity and reliability of multidimensional health locus of control scale for collage students”. *BMC PublicHealth*, *7:* 295.2007.

Mufaza, F.Y. “Peran RokokTerhadap Kualitas Hidup (Evaluasi Kuesioner SF-36v2 antara Perokok dan Non Perokok Laki-laki)”.*Skripsi*. Universitas Islam Negeri. 2015.

Mulyani, T.S.I. “Dinamika Perilaku Merokok Pada Remaja”. *Naskah Publikasi*. Program Magister Psikologi Universitas Muhammadiyah Surakarta. 2015.

Norman, P., Bannett, P., Smith, C., & Murphy, S. “Health Locus ofControl and Health Behaviour*”. Journal ofHealth Psychology*. DOI: 10.1177/135910539800300202. 1998.

Nurchayati, S. “Analisa Faktor-Faktor Yang Berhubungan Dengan Kualitas Hidup Pasien Penyakit Ginjal Kronik Yang Menjalani Hemodialysis Di Rumah Sakit Islam Fatimah Cilacap Dan Rumah Sakit Cilacap Dan Rumah Sakit Umum Daerah Banyumas”. *Tesis*. Universitas Indonesia. 2011.

Padmaningrum, R.T. “Rokok yang mengandung zat aditif yang berbahaya bagi kesehatan”. *JurdikKimia*. Universitas Negeri Yogyakarta. 2007.

Palu, M.B &Nurudin, A.A. “Potensi Yang Hilang BerdasarkanHealth Related Quality of Life Pada Penderita Kanker Payudara DiMakassar Sulawesi Selatan”. *Jurnal.*Universitas Hassanudin. 2014.

Pamungkas, D.B. “PerbedaanKualitas Hidup Laki – Laki Perokokdan Non Perokok yangDiukur dengan Kuisioner Sf-36v2 (Studi Pendahuluan)”. *Skripsi*. UniversitasIslam Negeri. 2014.

Pardede,J. “7 Kebiasaan Buruk yang Mengganggu Kesehatan”. Diunduh dari http://lifestyle.analisadaily.com/read/ -kebiasaan-buruk-yang-mengganggu-kesehatan/176593/2015/10/04 pada 5 Maret 2017. 6 Maret 2017.

Perwitasari, Ratih. “Motivasi danPerilaku Merokok pada Mahasiswa Ditinjau dari Internal Locus of Control dan External Locus of Control*”. Skripsi*. Universitas NegeriSemarang. 2006.

Putra, B.A. “Hubungan AntaraIntensitas Perilaku Merokok Dengan Tingkat Insomnia”. *Skripsi*.Univeristas Negeri Semarang. 2013.

Purba, Hunfeld, Iskandarsyah, Fitriana, Sadarjoen, Passchier & Busschbach. The Indonesian EQ-5D-5L Value Set. *PharmacoEconomics*.DOI 10.1007/s40273-017-0538-9. 2016.

Pinasti, W. “Pengaruh Self Efficacy,Locus of Control Dan Faktor Demografis Terhadap Kematangan Karir Mahasiswa UIN Syarif Hidayahtullah Jakarta”. *Skripsi.*Universitas Islam Negeri Jakarta. 2011.

Pradono, J., Hapsari, D., Sari, P. “Kualitas Hidup Penduduk Indonesia Menurut International Classifica Tion Of Functioning, Disability And Health (Ic F) Dan Faktor-Faktor Yang Mempengaruhinya”. *Jurnal*. Pusat Penelitian danPengembangan Ekologi dan Status Kesehatan Jakarta.2009.

Pramudiarja, Uyung. “*Mahasiswa Kedokteran di Yogyakarta Banyak yangMerokok*”. Diunduh dari http://health.detik.com/read/2012/03/22/094538/1874078/763/mahasiswa-kedokteran-di-yogyakarta-banyak-yang-merokok pada 16 Oktober 2016. 22 Maret 2012.

Rachmawati, A.M. “PerbedaanKualitas Hidup Antara Ibu Bekerja dan Ibu Rumah Tangga yang Memiliki Penyakit Kanker Payudara Serta Tinjauannya Dalam Islam”. *Skripsi*. Universitas Yarsi. 2015.

Reenen, M.V., Janssen, B., Oppe,M., Kreimeier, S., Greiner, W. “EQ-5D-Y User Guide, *Basicinformation on how to use the EQ-5D-Y instrument.* 2014.

Reenen, M.V & Janssen, B. “EQ-5D-5L User Guide *Basicinformation on how to use the EQ-5D-5L instrument”.* 2015.

Rini, I.S. “Hubungan Antara Efikasi Diri Dengan Kualitas Hidup Pasien Penyakit Paru Obstruktif Kronis Dalam Konteks Asuhan Keperawatan Di RS Paru Batu Dan RSU Dr. Saiful Anwar Malang Jawa Timur”. *Tesis.* Universitas Indonesia. 2011

Santrock, J.W. “*Life SpanDevelopment 7th Edition”.*Boston:Mac GrawHill.1999

Sarafino, E. P. “*Healthy psychology”.* 2nd edition. New York: John Wiley n Sons. 1994.

Sari, M.P. “Perilaku Merokok dikalangan Anak Sekolah Dasar”. *Skripsi*. Universitas Bengkulu. 2014.

Sarumpaet, R.D., Juffrie, M., Suprihati., Astuti, I. “Pengaruh Asap Rokok terhadap Kualitas Hidup Total Penderita Rintis Alergi Persisten”. *Jurnal.* ISSN: 2443-0935. 2016.

Schultz, D.P,.& Schultz, S.E. “*Theories of Personality 9th edition*”. USA: Wadsworth.2005.

Septiaday, A.S & Suhana. “Hubungan Antara *Health Locus ofControl* Dengan *Self Efficacy* PadaPasien Gagal Ginjal Akut Yang Menjalani Hemodialisa Di Rumah Sakit Al-Islam Bandung”. *Jurnal.* ISSN: 2460-6448. 2015.

Shiddiq, M. R. “Fatwa majelisulama indonesia tentang pengharaman merokok*”. Skripsi.* Yogyakarta: Universitas Islam Negeri.2009.

Simanjuntak, M.H. “51 Persen Penduduk Indonesia Perokok Terbesar di Asia Tenggara”. Diunduh dari http://www.antaranews.com/berita/478550/51-persen-penduduk-indonesia-perokok-terbesar-di-asia-tenggara, pada 16 Oktober 2016. 6 Februari 2015

Sugiyono *Statistika untukpenelitian*. Bandung: Alfabeta. 2010.

Sukarno, P.A. “Jumlah Perokok Terus Meningkat, Indonesia Tertinggi Kedua Di Dunia”. Diunduh darihttp://lifestyle.bisnis.com/read/20140601/220/232021/jumlah-perokok-terus-meningkat- indonesia-tertinggi-kedua-di-dunia, pada 25 Desember 2016. 1 Juni 2014.

Susanti. “Merokok Juga Berdampak Buruk bagi Perekonomian Keluarga”. Diunduh dari http://nationalgeographic.co.id/berita/2014/12/merokok-juga-berdampak-buruk-bagi-perekonomian-keluarga, pada 23 Agustus 2017. 10 Desember 2014

Tillman, M & Silcock, J. “A Comparsion of Smokers and Ex-Smokers Health Related Quality of Life”. Vol 19 No 3, PP.268-273. 1997.

Tristanti, I.Remaja dan Perilaku Merokok*. Jurnal.*STIKES Muhammadiyah Kudus. ISSN: 2407-9189. 2016

Vakeflliu, dkk. “Tobacco Smoking Habits, Beliefs, and Attitudes among Medical Students in Tirana, Alabina”. DOI:10.1006/pmed.2001.0994. 2002.

Vogl M, Wenig C, Leidl R, Pokhrel S. “Smoking and Health Related Quality of Life in English General Population: Implication For Economics Evaluation”. *BMC Public Health. 2012; 12(203). Hlm 5 – 7*. 2012

Wardana, A.K. “*Jumlah Perokok di Indonesia Terbanyak di Dunia, Kalahkan Rusia dan China*”. Diunduh dari http://makassar.tribunnews.com/2016/05/25/jumlah-perokok-di-indonesia-terbanyak-di-dunia-kalahkan-rusia-dan-china pada 22 Oktober 2016. 25 Mei 2016

Wallston, K. A.. Wallston, B. S..& DeVellis. R. F. “Development of the Multidimensional Health Locus of Control (MHLC) scales”. *Health Education Monographs, 6, 160-170*. 1978.

Wallston, B.S., & Wallston. K.A. “Health Locusof Control Scale”.Research with the Locus of Control Construct (vol. 1). 1981.

Assessment Methods WHOQOL. Group *Division ofMental Health And Prevention Of Substance Abuse World Health Organization. Programme onMental Health*. 1997.

Widiastuti, M. “Hubungan TingkatKetergantungan Rokok Dengan Health-Related Quality Of Life Pada Masyarakat Kabupaten Sleman, Kota Yogyakarta, Dan Mahasiswa Universitas Gadjah Mada”.*Skripsi.* Universitas GadjahMada. 2014.

Wille, Nora., Xavier, B., & Gouke, B. “Development of the EQ-5D-Y: a child-friendly version of the EQ-5D”. *Qual Life Res, 19, 875-886*. 2010

Winurini, S. “Penyebab Relapse (Kembali Merokok) Pada Perokok Berat Ditinjau Dari Health Belief Model”. *Pusat Pengkajian Pengolahan Data dan Informasi Sekretariat Jenderal DPR RI. Vol. 2, No. 1*. 2012.

Xiang, dkk. Cigarette Smoking among Medical College Students inWuhan, People’s Repbulic ofChina. DOI: 10.1006/pmed.1999.0525. 1999.

Yazid. “*Laksanakanperintah, jauhi larangan, dan jangan banyak bertanya”*. Diunduhdari https://almanhaj.or.id/3489-laksanakan-perintah-jauhi-larangan-dan-jangan-banyak-bertanya.html pada 13 Juni 2017.16 Januari 2013

Zahran, dlkk. “Health Related Quality of Life”. *Surveillance-United States, 1993-2002. Vol. 54 / SS-4*. 2005.

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Determinant Factors of Pulmonary Tuberculosis Incidence at Tilamuta Public Health Center of Boalemo District

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Article Info

Keyword:

Tuberculosis,
Gendre,
Education,
Knowledge,
Household Contact History

ABSTRACT

This study examined determinat factors of Tuberculosis incidence in Boalemo District. Tuberculosis is the contaminating disease which is caused by the bacteria in from of stem known as The *Mycobacterium Tuberculosis.*The research used quantitative method by *cross sectional* approach. The research was conducted during march and april of 2017. The participants of this research was 201 patients, collected by *purposive sampling* tecnique. Therefore, the data analysed by multivariate analysis. The research found that the household contact history (*ρ = 0.000)* and the residential density (*ρ = 0,000)* had a very strong influence on incidence of pulmonary tuberculosis in Tilamuta Public Health Center.It is expected that the society should improve the knowledge about the tuberculosis disease through the annoucements, informations and public health services.

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1. INTRODUCTION

Pulmonary Tuberculosis is an Infectious Disease caused by Mycobacterium Tuberculosis. These acid stem bacteria can be pathogenic or saprophytic organisms. There are several pathogenic microbacteria, but only human bovine strains and pathogens. Tubercle Bacteria measure to 0.3 × 2 to 4 µm, which is smaller than red blood cells(Barrah, 2013).

According to The World Health Organization (WHO), one-third of the world's population has been contracted by TB. In 2000, more than 8 million people suffered from active TB. TB disease is responsible for the deaths of nearly 2 million people every year, mostly in developing countries. WHO estimates that TB is the most infectious disease that causes death in children and adults.Data from WHO in 2012 indicated that the highest incidence was found in Asia (58%) and Africa (27%), whereas Indonesia ranked fourth as the country with the highest incidence of Tuberculosis after India, China and South Africa(Kartasamita, 2009).

Based on the World Tuberculosis Pulmonary Tuberculosis Global Report (WHO) in 2011, the prevalence of Pulmonary Tuberculosis in Indonesia is estimated to be 289 per 100,000 population. In Indonesia in 2013, the number of new cases of Acidic Acid Basil (BTA +) was 196,310 cases, which decreased when compared to new cases of BTA + found in 2012 which amounted to 202,301 cases(Kartasamita, 2009).

Tuberculosis (TB) disease has long been an endemic contagious disease in Indonesia and currently Indonesia is ranked fifth with the highest number of TB cases in the world. TB cases are found in all provinces in Indonesia, where Papua, DKI Jakarta, and Banten are the 3 provinces with the largest number of TB cases in Indonesia. The estimated prevalence of all TB cases is 660,000 with an incidence estimation of 430,000 new cases per year. The number of deaths from TB is estimated to be 61,000 deaths per year(Wijaya, dkk, 2013).

Tuberculosis (TB) is one of the infectious diseases with high incidence rate in Indonesia. The result of SKRT 2004 shows that the national prevalence rate of TB is 110/ 100.000 population. Regionally, in Java the rate is 110 / 100.000, in Sumatra is 160 / 100.000, and in KTI is 210 / 100.000. Moreover, in Bali and DIY the rate is 68 / 100.000 population. The definitive diagnosis of tuberculosis, like other infectious diseases, is to find Mycobacterium Tuberculosis in sputum, gastric, cerebrospinal, pleural, or tissue biopsies. Various studies show that the organ that most often play the role of entry of M Tb bacteria is the lung because of transmission of TB through inhalation or aerogen. Therefore, the standard of TB diagnosis is to find germs in sputum(Mustikawati, dkk, 2011).

In 2014, there were 176,677 new cases of BTA +. It was declining when compared to new cases of BTA + found in 2013 which amounted to 196,310 cases. The highest number of reported cases was found in provinces with large populations, such as West Java, East Java, and Central Java. New cases of BTA + in these three provinces accounted for 40% of all new cases in Indonesia(Depkes RI, 2014).

Based on Riskesdas datain 2013, the prevalence of Indonesian population ofhavingPulmonary TB was 0.4%. Gorontalo was included in 5 provinces with highest Pulmonary TB rate (0.5%) besides the other 4 provinces, i. e. West Java (0.7%), Papua (0.6%), DKI Jakarta (0.6%), Banten (0.4%) and West Papua (0.4%)(Depkes RI, 2014).

The total number of new cases of TB BTA + found in Gorontalo Province in 2014, which were mostly in Gorontalo Regency, was 620 cases with as much as 124 cases in Pohuwato Regency. The averageCase Notification Rate (CNR) in Gorontalo is 179 per 100,000 population. This figure cannot describe the actual situation in the field because the discovery of this case is based on the performance of the officers in the field. This number increases compared to that in 2013 with CNR (Case Notification Rate) of 163 per 100,000 population. The indicator of success of treatment program of BTA Pulmonary TB positive can be measured in the success rate number. Percentage of Success Rate (SR) is Percentage of BTA Pulmonary TB patients who have recovered, as well as % of patients with Pulmonary Tuberculosis BTA + who have finished their treatment. In Gorontalo Province, the success rate reaches 85.3% with the highest ratefound to be in Bone Bolango regency with 98.5% and the lowest rate found to be in Pohuwato Regency with 15.2%(Depkes RI, 2014).

The data from the Boalemo District Health Office in 2016 showed that the number of Pulmonary TB sufferers who were examined to have persistent symptoms in 2014 was 274 people, by 2015 the number increased to be 294 people, and in 2016 the number of Pulmonary TB patients decreased to be 219 people. In Tilamuta District Health Center of Boalemo District, the case amounted to 70 people and in Suspeet it amounted to 355 people.

Base on the data obtained, this study aims to determine factors of Pulmonary Tuberculosis incidence in Tilamuta Public Health Center of Boalemo Regencyin the year of2017.

2. RESEARCH METHOD

The research is analytical research with cross-sectional study design. This study studied the relationship between risk factor (independent) and effect factor (dependent), where the observation or measurement of variables were done simultaneously at the same time [Riyanto, 2014].

This research was conducted at Tilamuta Health Center Tilamuta Sub-district, Boalemo Regency in 2017. Population in this research is all visiting and suspected patients in the year of 2016 with a total number of 425 people. The sample in this research was Case and Suspect of 201 people obtained by purposive sampling technique. Dependent variable in this research was Lung TB incidence. The independent variables in this study were Sex, Education, Home Contact History, and Occupancy Density.

The data were analyzed using chi-square test for bivariate test, and multiple logistic regression test for multivariate test to see the variables that have strong influence on the incidence of Tuberculosis at Tilamuta Public Health Center in Tilamuta District, Bualemo Regency in 2017. Independent variables issaid to have a significant influence on the dependent variable if the significance level of $p<0.05$. Meanwhile, the variable can be categorized as a candidate for multivariable test if the value of $p = <0.25$.

3. RESULTS AND ANALYSIS

Bivariate Analysis

The result of simple logistic regression analysis showed that sex did not have significant relationship with Pulmonary Tuberculosis event with p value = 0.770> α 0.05. It can be seen in the following table:

Table 1 Analysis of Gender Relations withPulmonary Tuberculosis

Gender	The incidence of Pulmonary Tuberculosis				Percentage	P value
	Pulmonary TB		Non Pulmonary TB			
	N	%	N	%		
Male	62	52.1	57	47.9	119 (100)	0.770
Female	41	50.0	41	50.0	82 (100)	
Total	103	51.2	98	48.8	201 (100)	

The result of simple logistic regression analysis showed that education did not haveany significant relationship with Pulmonary Tuberculosis with p value = 0.203> α 0.05. It can be seen in following table:

Table 2 Analysis of Education Relationship withPulmonary Tuberculosis

Education	The incidence of Pulmonary Tuberculosis				Percentage	P value
	Pulmonary TB		Non Pulmonary TB			
	N	%	N	%		
Low	95	52.8	85	47.2	180 (100)	0.203
High	8	38.1	13	61.9	21 (100)	
Total	103	51.2	98	48.8	201 (100)	

The result of simple logistic regression analysis indicated that knowledge had a significant relationship with Pulmonary Tuberculosis event with p value = 0,000 <α 0.05.It can be seen in the following table:

Table 3 Analysis of Knowledge Relations withPulmonary Tuberculosis

Knowledge	The incidence of Pulmonary Tuberculosis				Percentage	P value
	Pulmonary TB		Non Pulmonary TB			
	N	%	N	%		
Less	102	99,0	1	1,0	103 (100)	0.000
Enough	1	1,0	97	99,0	98 (100)	
Total	103	51,2	98	48,8	201 (100)	

The result of simple logistic regression analysis showed that household contact had significant relationship with Tuberculosis Lung incidence with p value = 0,000 <α 0.05. It can be seen in the following table:

Table 4 Relationship Analysis of Household Contact History withPulmonary Tuberculosis

Household Contact History	The incidence of Pulmonary Tuberculosis				Percentage	P value
	Pulmonary TB		Non Pulmonary TB			
	N	%	N	%		
Exist	102	99.0	1	1.0	103 (100)	0.000
Do not Exist	1	1.0	97	99.0	98 (100)	
Total	103	51.2	98	48.8	201 (100)	

The result of simple logistic regression analysis showed that occupancy density had significant relation with Tuberculosis Lung incidence with p value = 0.000 <α 0.05. It can be seen in the following table:

Table 5 Analysis of Occupational Density Relationship withPulmonary Tuberculosis

Residential Density	The incidence of Pulmonary Tuberculosis				Percentage	P value
	Pulmonary TB		Pulmonary TB			
	N	%	N	%		
Solid	103	100	0	0.0	103 (100)	0.000
Not Solid	0	0.0	98	100	98 (100)	
Total	103	51.2	98	48.8	201 (100)	

Multivariate Analysis

The analysis performed was multiple logistic regression with prediction model. Variable screening or selection was performed before doing the multivariate analysis by performing bivariate analysis of each independent variable with the incidence of Pulmonary Tuberculosis. Multiple logistic regression is useful to know which independent variable has the strongest relationship to the status of Pulmonary Tuberculosis incidence.

In multivariate analysis,the determinant factors that affect the incidence of Pulmonary Tuberculosis are expected to be predicted. The result of independent variable selection can be seen in the following table:

Table6Selection of Independent Variables to be Analyzed Using Multivariate Analysis

No	Variable	p *value*
1	Gender	0.770*
2	Education	0.203
3	Knowledge	0.000
4	Residential Density	0.000
5	Household Contact History	0.000

is removed from the model (p> 0.25)

Based on the result of bivariate selection test, 4 of 5 variables were found to be qualified tothat can be included in multivariate analysis among others, i. e. education, knowledge, home contact, and occupancy density. In the final stages of multivariate test, 2 variables had a very strong effect on the incidence of Pulmonary Tuberculosis, including:

Table 7 Final Results of Multivariate Analysis Using Multiple Logistic Regression

Variable	p Value
Household Contact History	0.000
Residential Density	0.000

4. CONCLUSION

a. There is not any significant relationship between Gender and Education with Lung Tuberculosis at Work Area of Tilamuta Health Center of Boalemo Regency in 2017.
b. There is a significant relationship between knowledge, household contact history, and residential density with Pulmonary Tuberculosis at Tilamuta Community Working Area of Boalemo Regency in 2017.
c. Household contact, historyand residential density have a very strong influence on the incidence of Pulmonary Tuberculosis at Tilamuta Community Working Area of Boalemo Regency in 2017.

ACKNOWLEDGEMENTS

This study was carried out within a wider research program on remote sensing and epidemiology and was funded by Public Health Faculty of Gorontalo University.

REFERENCES

Barrah, dkk, 2013. *Asuhan Keeperawatan panduan lengkap menjadi keperawatan.* Cetakan pertama. Jakarta – Indonesia

Depkes RI, 2014. *Prevalensi Tuberculosis Paru ;* Jakarta

Kartasamita, 2009. *Faktor-faktor yang memepengaruhi kejadian TB Paru di RW.* *http://digilib.sunggul.ac.id./public/UEU-underraduate-7539*

Mustikawati, dkk, 2011. *Panduan dignosis TB Anak dengan sistem skorning*. Cetakan pertama. Kementrian Kesehatan ; Jakarta

Riyanto, 2014. *Aplikasi metodologi Kesehatan.* Cetakan pertama. Nuha Medika ; Yogyakarta.

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Family Support Among for Diabetic Foot Ulcer Patients (Qualitative Study in Three Tribes in West Kalimantan)

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Article Info

Keyword:

Diabetic Foot Ulcer
Family Support
Tribes of Melayu,
Dayak,
Tionghoa.

ABSTRACT

The purpose of nursing care is to improve the quality of life of patients with diabetic foot ulcer (DFU). One important aspect for patients with DFU is family support as family activity and relationship influence the patients' physiological and quality of life. This study aims to explore family support for diabetic foot ulcer by using ethnography approach. It involves nine participants from nine tribes in West Kalimantan. There were four themes that emerged: the quality of family support and caring were good and comprehensive, better information, support and emphaty could improve patients' motivation, family is a safe place to express emotion, and family support could improve patients' self esteem and compliance to wound healing management procedure.

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1. INTRODUCTION

The prevalence of diabetic foot ulcer (DFU) in patients with DM continues to increase and steal the attention of many parties to explore the factors related to wound care healing. The purpose of this exploration is to discover the factors that can accelerate wound healing process so that patients can achieve optimal quality of life. Based on some quantitative studies on factors that affect DFU healing process, this exploration focuses on physical, social, environmental, life-style management, nutrition, family support, interpersonal relationships, immunity, and psychosocial support (Suriadi, 2010).

It takes a minimum awards from family to increase the self-confidence and social interaction of people with DM. Individuals spend more time with family and community than the health team. 99% of the time will be spent with families, at workplaces and communities so that the roles and support of the family and community is very influential on the healing of the patients(Creswell, 2016)(Kolbaca,1991).

Non optimal family support will result in stress to the patient. The stress response caused by the disturbance of self-concept and individual social interaction will affect the work of hormones such as glucocorticoids, catecholamine, oxytocin, vasopressin, and cytokine production, resulting in the healing of the wound itself. Patient's health is greatly influenced by social support that will ultimately affect to the work of the patient's heart, neuroendocrine, and immunity(Gouin,2012).

The results of preliminary study through random interviews to some patients with DFU showed that90% of them agreed that family support is needed in their current conditions.Based on this phenomenon, the authors are interested to explore family support with the approach of Kolcaba's theory of Comfort,at Kitamura Clinic, Pontianak.The participants werein the 3 largest tribes in West Borneo,i.e. Dayaknese, Melayunese, and Tionghoa.In the end, the researchers can determine specific assessment tools and interventions which are in accordance with the needs of the patients so that the optimal quality of life of the patients can be achieved.

2. RESEARCH METHOD

The method used in this study was qualitative with ethnography approach. The aim of qualitative phenomenological research is to describe a "live experience" of a phenomenon (Creswell, 2016). The participants of this study were DFU patients at Kitamura Clinic, Pontianak. There were as many as9participants.Theywere selected throughpurposive sampling methods, in which each tribe was represented by 3 participants. Before the interview, all of the participants were asked to read the purpose of this study and listen to the explanation from the researchers. If participants agreed, they should sign the informed consent. This research was conducted at Clinic Kitamura Pontianak, from December 2016 to March 2017.The scopes of the problems in this study were as follows(Creswell, 2016).

Table. 1
Scopes of the problem

Category
Emotional Support
Informational Support
Appraisal Support
Instrumental Support

The qualitative interview guide refers to the variables studied and family support. The interview results were tested for validity with Aiken's V approach and obtained valid and reliable results with a range of values between 0-1. The processing and analysis of qualitative data used the Creswell model (2016). The course of research is listed in the following figure(Creswell, 2016).

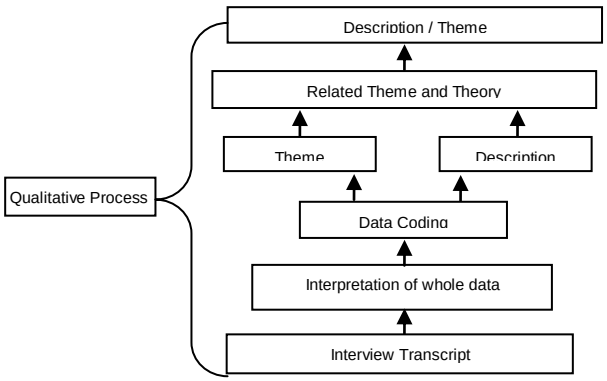

Figure 1
QualitativeProcedure

3. RESULTS AND DISCUSSION

Comfort is a concept that has a strong association with nursing, provided through assessment and intervention (Kolcaba, 1991). Comfort in patients with diabetic foot ulcer includes comfort in physical, psycho-spiritual, environmental, and social aspects (Kolcaba, 2003). Kolcaba began creating his theory charts by analyzing the concepts of various disciplines, namely nursing, medical, psychology, psychiatry, ergonomics and English (Kolcaba, 1991). Here is the conceptual framework described by Kolcaba (comfort theory):

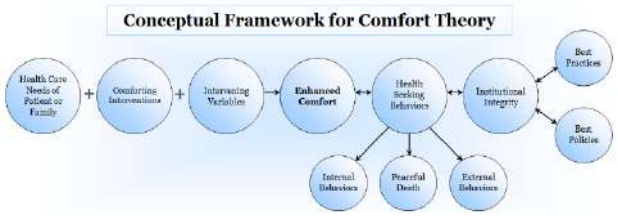

Figure2
Kolcaba's Conceptual Framework

The need for sociocultural comfort is for the assurance of culture, support, positive body language, and care. These needs are met through guidance that includes optimism, health messages and encouragement (Kolcaba, 2006). These social needs also include family needs for finance, employment assistance, and respect for cultural traditions and sometimes for friendships during hospitalization if family units have limited social networks. The discharge planning also helps meet the social needs for transition from hospital to home (Kolcaba, 2006). The social context in patients with diabetic foot ulcer consists of self-concept, interpersonal relationships (family and social environment), finance, and information needs (Kolcaba, 2014).

Family support is an aid received by family members from other family members. Family support is a form of support that serves as a source of practical and concrete support for other family members. The form of family support can be in good quality and comprehensive support. Showing empathy, providing facilities, and providing required information can certainly increase motivation and make patients feel more secure and comfortable when they are around the family (Bomar, 2014).

3.1. Participants Characteristics

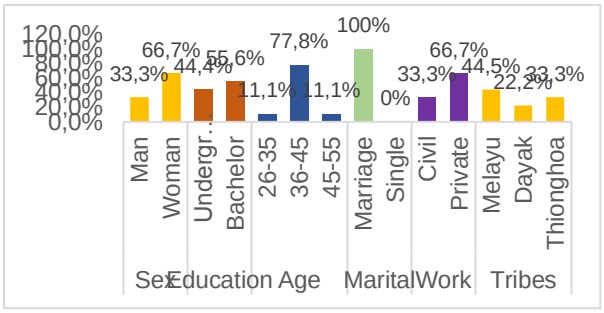

Figure3. Participants characteristics based on Sex, Ages, Education, Marital, Work and Tribesat Kitamura Clinic Pontianak, January 2017 (n=9)

The graph describe 66,7% participants were female, 77,8% of the participants were in the final adult stage (36-45 years), 55,6% of the participants' education was bachelor degree, 100% was married participants,66,7% were in private sector, and 44,5% tribes of participants were Melayunese.

3.2. Family Support for DFU Patients

Based on the analysis results, 4themes were obtained. All these findings are structured into a form of family support model of patients with DFU in Kitamura Clinic Pontianak. The recapitulation of the findings is illustrated in the following table:

Table 2. Result of Qualitative Analysis

Family Support	Quality of Support and Comprehensive Care from Family
	Information is obtained using technology and from health personnels
	Support and empathy can increase motivation to treatment process
	Family as a safe and comfort place to express emotion

DFU patients need support from families to improve their comfort and health. It is related to patient's compliance with treatment and care. It has some effects on the quality of life of patients (Kolcaba, 1991).

3.2.1 Quality of Support and Comprehensive Carefrom Family

Patients with DFU at Clinic Kitamura Pontianak receive good quality family support. The forms of support provided by family members are in the form of providing and facilitating transportation for care, financial assistance for medical expenses, and providing time for listening and advice on patient health. The quality of good support and comprehensive care of the family is the basis of the support that should be provided to patients with DFU (Sarafino, 2015).

Support and care provided by the family in a comprehensive manner aims to facilitate the patient in doing all activities related to the problems faced. In this case, the patient's limitations are in the use of facilities and infrastructure as well as the need for moral and material support in the

treatment process. Family is expected to be responsible for the needs of each family members, including the need for treatment. With a comprehensive care and good support to patients with diabetic foot injuries, it is expected that the health and motivation of patients in their treatment can improve the health status and good impact on quality of life (Sarafino, 2015)(Chen, 2012).

Family support can be in the form of a full family assistance in providing help, money, or time to serve and listen to the sick family in conveying their feelings. Patient will recover faster if the family helps him solve the problems effectively through their support.

3.2.2 Information is obtained using technology and from health personnels

In an effort to improve patient's knowledge, family members are expected to be more active in finding and providing information about the disease and the risks. Information can make the patients feel highly valued. From the results of the analysis, it is found that the family plays an active role in fulfilling the patient's information needs. The family attempts to provide the information needed by the patient (Teare, 2011)Information aid aims to improve the motivation of the patient to improve the health status optimally. Information support can reduce the burden of the family and certainly the burden of the patient itself. With the information, the patient will know the development of the disease, what complications and risks are likely to occur, so that the patient will be motivated to keep abreast of routine care(Effendi, 2013).

To get information on diabetic injuries, people mostly make use the internet. It is undeniable that the use of technology today is a necessity. The role of family and health personnel is needed to direct patients in finding health-related information. Accurate sources of information and appropriate media can be provided to patients to improve knowledge about diseases and treatment procedures during the treatment. More than 80% of patients with diabetes and its complications have insufficient knowledge and skills in managing the disease. The information therefore can be related to patient's conditions and how to treat it(Chaplin,,2010).

3.2.3 Support and empathy can increase motivation to treatment process

Supportive responses, attitudes, and expressions of empathy from family in treatment process make patients feel happy and valuable. The patient's perceived appreciation will have a positive impact to their treatment. Support in the form of positive attitudes and phrases from the family may affect their activities. Motivation and confidence of the patient comes from the family. In other words, patients who get high quality family support will have a high motivation in running the treatment process.

Another benefit, family support can also improve the patient's psychosocial status and self-esteem because the patient is still considered useful and exists in the family. Thus, the patient is expected to establish healthy behavior in an effort to improve health status(Tao,2011)(Schaper,2012).

Family support is expected to be consistent to the patient, given the long process of healing diabetic wounds. If the attitudes demonstrated by family members are unstable, of course, the patient can feel it. The unexpected negative impact is that the patient feels that the support provided by the family is a burden for the family in caring for the patient, and it certainly influences the patient's motivation (Schaper, 2012).

The family serves as a source of energy that determines happiness. Family is a place to socialize in giving advice, suggestions, information, and criticism. Decreasing family support along with the length of the healing process will have an effect on the patient's motivation in the healing process(Upton, 2014).

3.2.4 Family as a safe and comfort place to express emotion

Family is the closest and comfortable place for every individual. Family can increase the morale and motivation that affects psychological and mental statusso that the patient can manage his emotion. Patients with DFU who are unable to manage their emotion are at risk of falling under stress. Stress or depression causes negative implications for wound care management and patient's quality of life. Negative family support is one of the causes of depression(Upton, 2014).

Psychological stress can clinically affect wound healing and the workings of some hormones. Influential hormones include cortisol, glucocorticoids, ketocalamine, oxytocin, vasopressin, and cytokine which can lead to wound hypoxia. As is known, increased cortisol due to stress will affect the increase of glucose through gluconeogenesis, protein, and fat metabolism. In addition, cortisol can also affect the absorption of blood glucose levels and will affect the patient's immune system. The impacts that occur both physically and psychologically in patients will greatly affect the quality of life and diabetic wound healing on the patient's feet (Sunaryo, 2014).

With the support of family, of course, patient will be able to maintain psychological health and improve his self-concept. DFU patients who are in family environment and are emotionally noticed by members of the family will be able to generate feelings of security and comfort. Therefore, the patient is sure that the family cares about him. This will certainly be very beneficial for the healing process of patients with DFU(Upton, 2014)(Sunaryo, 2014).

4. CONCLUSION

There are 4 (four) themes of qualitative analysis results on family support of diabetic foot patients at Clinic Kitamura Pontianak, i.e. quality of support and comprehensive care from family,obtained information through the use of technology by family and health personnels, support and empathy to increase motivation to treatment process, family as a safe and comfort place to express emotion.This research succeeded in exploring the needs of family support for diabetic foot wounds patients in three tribes in West Kalimantan. The suggestion from this study is that instrument development is needed to measure family support especially in patients with diabetic foot injuries

REFERENCES

Bomar, P.J. (2014). *Promoting Health in Families: Applying Family Research and Theory to Nursing Practice*. Saunders. Lippincott

Chaplin. E,S. (2010). Coping, Control, and Adjustment in Type 2 Diabetes*. Journal of Consulting and Clinical Psychology.* Vol.20.No.3. 208-216.

Chen. (2012). *Health Behavior and Health Education: Theory, Research and Practice Fourth Edition*. United States America: John Wiley and Sons

Creswell, John W. (2016). *Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed Edisi Ketiga.* Yogyakarta. Pustaka Pelajar.

Effendi, F. (2013). *Keperawatan Kesehatan Komunitas : Teori dan Praktek dalam Keperawatan*. Jakarta. Salemba Medika Tracey, P. (2010). Psychological Aspects of Wound Care: Implications for Clinical Practice. *JCN*. Vol.16, No.1. pages 23-38

Firman A., Wulandari, I., & Rochman, D. (2012). Kualitas Hidup Pasien Ulkus Diabetik Di Rumah Sakit Umum Daerah Serang. *Tesis*. Universitas Indonesia. Jakarta

Gouin,J. (2012). The Impact of Psychological Stress on Wound Healing: Methods and Mechanisms. *NIH Public Access*, 31(1): 81-93

Grant, W. (2013). Adults with Diabetes Who Perceived Family Members Behaviour as Unsupportive are Less Adherent to their Medication Regimen*. Evidance Based Nursing.* Vol.16,No.1. 15-16

Kolcaba. K. (1991). A Taxonomic Structure for the Concept Comfort. *Articlein Image—The Journal Of Nursing Scholarship, February 1991*

----------. (2003). *Comfort Theory and Practice: A Vision for HolisticHelath Care and Research.* New York : Springer Publishing Company

----------. (2006). *Comfort Theory: A Unifying Framework to Enhancethe Practice Environment.* The Journal of Nursing Administration.Volume 36,Number 11, pp 538-544

----------. (2006). Evolution of the Mid Range Theory of Comfort for Outcomes Research. *Nursing Outlook*, *Volume*. 49, No.2

----------. (2014). Comfort and Hope in The Preanasthesia Stage in Patient Undergoing Surgery. *Article in Journal of Perianesthesia Nursing,June 2014*[12] Coffman, J. (2008). Family Support and Health: A Review of Physiological Processes to Disease Outcomes. *Journal of Behaviour Medicine*. Vol.4, No.1. pages 257-267

Sarafino, E.P. (2015). *Health Psychology: Biopsychosocial Interaction*. New York. John Wilky Inc.

Schaper, N, C. (2012) Specific guidelines for the diagnosis and treatment of PAD in a patient with diabetes and ulceration of the foot 2011. *Diabetes/Metabolism Research and Reviews*. 2012; 28: 236–237

Sunaryo. (2014). *Psikologi Untuk Keperawatan*. Jakarta. EGC

Suriadi. (2010). *Manajemen Luka*. Sekolah Tinggi Ilmu Keperawatan Muhammadiyah. Pontianak

Tao, H. (2011). Impact of Social Environmental Factors on Re-Hospitalization of Home Healthcare Elderly Patients. *Proquest, Nursing Health Policy Program*

Teare, J (2011). Using Quality of Life Assessment in Wound Care. *Proquest Nursing & Allied Health Sources, Nursing Standard*; Oct 2011; 17, 6:59-68

Uchino, B.N. (2016). Social Support and Health: A Review of Physiological Processes Potentially Underlying Links to Disease Outcomes. *Journal of Behaviour Medicine*. Vol.2, No.4. pages 377-387

Upton, D. (2014). Psychological Aspects of Wound Care: Implications for Clinical Practice. *JCN*. Vol.28, No.2. pages 52-57

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The Quality of Life Among Elderly in Jember District, East Java, Indonesia

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Article Info

Keyword:

Quality of life,
Elderly,
Family support,
Physical activities,
Social participation.

ABSTRACT

Elderly is a condition in which has decrease in physical, mental, and social abilities. The limitations of elderly can hamper they well-being so that can impact on the lowering of their qualities of life. Bina Keluarga Lansia (BKL) is a group that be formed by BKKBN that aims to improve the quality of life among the elderly. One of the BKL groups of Jember District is BKL group ofKalisat Sub District. This study aimed to assess the difference in quality of life among elderly between BKL members and non-BKL members based on individual characteristic, family support, physical activities and social participation. This research used observational, analytical, and cross sectional studied. A total of 100 elderly people (age> 60 years) were studied with details of 50 BKL members and 50 non-BKL members. Data was analyzed using Chi Square, Mann Whitney, and Kruskal Wallis test with significance of 0.05. Elderly BKL members have better subjective quality of life and higher score of all domains than the elderly non-BKL members. The result of this study means that BKL programed in District of Kalisat, Jember Regency have succeeded to improving quality of life of elderly with related factor such as family support, social participation, and physical activities.

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1. INTRODUCTION

Increasing life expectancy has increased the number of elderly people in Indonesia (Badan Pusat Statistik. 2015). Elderly is a condition in which a person experiences a decrease in physical, mental, and social abilities (Kuswardani, 2009).Limitations on the elderly can hamper his well-being until it can ultimately have an impact on the deterioration of his qualities of life (Rohmah, 2012).The quality of life is the overall perception of the individual about the happiness and satisfaction from the life and environment in which he lives (Skevington, 2004).

Family support is included in the reinforcing factor that can affect a person's behavior and lifestyle thereby affecting his / her health status and quality of life (Yenni. 2011).Due to the development of the pattern of family life that physically leads to the form of a small family, kinship relationships are getting weaker. This causes the elderly family members to be under-paid, respected, and respected (Nugroho, 2012).The social busyness of the elderly will diminish as the age continues (Tamher, 2009). The transformation of society's social values leads to an individualistic society, causing the elderly to be less respected and respected. Therefore the elderly become marginalized from community life and can become abandoned (Padila. 2013).The functional ability of the elderly in carrying out his daily life functions should be maintained as far as possible(Tamher, 2009).Physical activity is one of the

determinants of quality of life in the elderly (McNaughton, 2012).Exercise is part of physical activity aimed at maintaining physical fitness (Welis, 2013). The elderly require some adjustment in daily physical activity because of the physical limitations it has(Fatmah. 2010).

Along with the increasing complexity of problems faced by the elderly, through the Family Resilience and Family Welfare program, BKKBN has established Elderly Family Development Group in all villages and villages in Indonesia. Several activities with related sectors such as health and education have been conducted to keep the elderly healthy, independent, active, and productive (BKKBN. 2015).Elderly Family Development (Bina Keluarga Lansia/BKL) is a group that aims to keep the elderly healthy, independent, active, and productive to ultimately improve the quality of life(BKKBN. 2016b).One of the BKL groups of Jember is BKL group of Kalisat Subdistrict.

This study aims to determine the difference in quality of life between the elderly BKL members of elderly non-BKL members of Kalisat District Jember Regency along with factors related to the quality of life of the elderly. Activities in the BKL group may be able to support family support for elderly, elderly social participation, physical activity, and elderly sports activities so as to improve the quality of life of elderly.Pengukuran quality of life of the elderly can be used as an indicator of the impact on BKL program on the elderly in the District Kalisat Jember District.

2. RESEARCH METHOD

This was an analytic study with cross sectional design. The study was conducted in Kalisat Sub-district, Jember District in 2017. The population in this study were all elderly people aged 60 years and over in 5 villages in Kalisat Sub-district, Jember District. The exclusion criteria for this study were the elderly who were not able to be interviewed due to hearing impairment or speech impairment, the elderly who were unable to perform the basic activities independently (bathing, dressing, toilets, shifting places, and eating) and the elderly who were mentally disturbed. The sample selection was done by simple random sampling. The calculation of research sample using Sastroasmoro and Ismael formulas so as to produce the same proportion between 2 independent groups. The samples in this study totals 100 respondents, with details 50 elderly BKL members and 50 elderly non BKL members. The research instrument used WHOQOL-BREF questionnaire with 26 questions. Data analysis was performed univariable and bivariable through chi square test, mann whitney, and kruskal wallis with significance of 0.05. Data were analyzed using SPSS version 22.

3. RESULTS AND ANALYSIS

3.1. The quality of life among elderly based on individual characteristics

Most elderly people have good life quality (49%). When viewed on the 4 domains of WHOQOL-BREF life quality in Table 1, it is known that the mean score of physical domain (58.04 ± 16,74) has the highest average score compared to the other three domains of quality of life.While the environmental domain (49.97 ± 14.47) had the lowest average score. Social domains have the most incoming scores in less categories than the other three domains while the physical and psychic domains have the most incoming scores in either category.

Table1. Mean Score of domain of quality of life among elderly

Domain	Mean	±SD	Minimum Score	Maximum score
Physical	58.04	16.74	17.86	89.29
Psychic	56.67	15.24	20.83	87.50
Social	55.92	15.41	16.67	91.67
Environment	49.97	14.47	12.50	84.38

Table 2. Subjective Quality of Life among Elderly based on Individual Characteristics

Characteristics	Quality of Life				Total		Sig.	χ^2
	Poor		Good					
	n	%	n	%	N	%		
Age								
Elderly (60-74 years old)	32	32	44	44	76	76	0.300	1.072
Old (75-90 years old)	13	13	11	11	24	24		
Sex								
Male	9	9	16	16	25	25	0.296	1.091
Female	36	36	39	39	75	75		
Education								
Not education	22	22	15	15	37	37		
Elementary school	21	21	21	21	42	42	0.001*	14.22
Middle and high school	2	2	19	19	21	21		
Occupation								
No	30	30	33	33	63	63	0.492	0.472
Yes	15	15	22	22	37	37		
Marital Status								
Widow	28	28	28	28	53	53	0.095	2.793
Married	17	17	30	30	47	47		

Note: * significance level at α < 0.05, using*Chi Square test*

Based on Table 2, it can be seen that there is no significant difference in the quality of life subjectively based on age (p = 0.300), gender (p = 0.296), employment status (p = 0.492), and elderly marriage status (p = 0.095). Nevertheless, there is a significant difference in the quality of life subjectively based on the level of elderly education (p = 0.001). Elderly who have high and middle level of education mostly have a good quality of life and very good while the elderly who do not go to school mostly have poor quality of life and mediocre. It shows that elderly who have higher education tends to have a better quality of life.

Table 2. Informed that there was a significant difference in quality of life in the environmental domain (p = 0.013) based on the age of the elderly. The mean rank at age 60-74 is higher than the age of 75-90 years. This shows that elderly people aged 60-74 years tend to have a better quality of living environment domain than the elderly who aged 60-74 years. There are significant differences in the quality of life in all domains based on educational level and elderly marital status. Elderly who have secondary and higher education have higher mean rank of life quality score while elderly who do not have a mean more ranklow in all domains. It shows that elderly who have higher education tend to have a better quality of life in the physical, psychological, social, and environmental domains. Married elderly people have a higher mean rank across all live life domains. It shows that older couples tend to have a better quality of life in the physical, psychological, social, and environmental domains than the elderly who have no spouse or widow status.

Based on the results of the study note that elderly people aged 60-74 years more who have good quality of life and very good than the age of 75-90 years. Nevertheless, after analyzing with chi square test, it was found that there was no significant difference in the quality of life of the elderly subjectively based on age. Most of the Elderly in Kalisat Sub-district of Jember District are more accepting of their health condition and problems. Tamher and Noorkasiani (Tamher, 2009) stated that the more advanced a person's age, his or her physical abilities will decrease, resulting in a disruption in meeting his needs and affecting his happiness. But on the other hand, the more aged a person, the more ready also in receiving the ordeal. The results of this study also get the result that the more advanced a person tends to have a lower quality of life in the environment domain. The reduced physical ability of the elderly can reduce the integration with the environment so that opportunities to acquire skills, new information, creative opportunities, and activities in the environment will also be smaller.

Based on the analysis using chi square, it was concluded that there was no difference in quality of life based on elderly gender. The results are not in line with Wikananda's research(2017) that the tendency to have a better quality of life is in women than in men. Gender analysis on the quality of life of the elderly by the domain resulted in the mean rank of elderly men being higher in the physical, social,

and environmental domains while the mean female elderly rank was higher only in the psychic domain alone. According to Tamher and Noorkasiani (Tamher, 2009),gender differences are one of the factors affecting the elderly psychic so that it will affect the form of adaptation used. Women tend to be better able to deal with problems than men who tend to be more emotional. However, based on the level of significance, it was found that there was also no significant difference in quality of life in all domains based on elderly gender in Kalisat Sub-district, Jember.

Table 2. Mean-rank Score of Quality of life according individual characteristics

Characteristics	Domain of Quality of Life							
	Physical		Psychical		Social		Environmental	
	Mean Rank	Sig.	*Mean Rank*	Sig.	*Mean Rank*	Sig.	*Mean Rank*	Sig.
Age								
Elderly (60-74)	51.82	0.418	52.97	0.128	53.15	0.098	54.55	0.013*
Old (75-90)	46.31		42.67		42.10		37.69	
Sex								
Male	53.00	0.618	48.46	0.684	54.78	0.386	52.94	0.626
Female	49.67		51.18		49.07		49.69	
Education								
Not Education	42.91		37.57		40.66		36.35	
Elementary school	48.65	0.007**	49.05	< 0.001**	45.55	0.001**	50.07	0.001**
Middle and high school	67.57		76.19		77.74		76.29	
Occupation								
No	49.57	0.675	53.50	0.175	53.54	0.126	53.48	0.179
Yes	52.08		45.39		44.81		45.42	
Marital Status								
Widow	45.18	0.051*	44.93	0.041*	42.00	0.002*	44.80	0.037*
Married	56.50		56.78		60.09		56.93	

Note: * significance level at α < 0.05, using *Mann Whitney test;* ** significance level at< 0.05, using *Kruskal Wallis test*

Elderly who have higher education tend to have subjective quality of life and according to the physical domain, psychic, social, and environment better. In line with the results of the study, Wikananda (2017) mentions that higher education in the elderly is associated with a good quality of life. Kumar et al. (2014) also states that the elderly who are not in school tend to have a lower quality of life. Indrayati(2013)argued that highly educated societies were more important to the value of health than lower educated people.

The results stated that there was no significant difference in the quality of life of the elderly subjectively and according to the domain based on the status of their work. According to Hurlock(1980),the income scale for most elderly workers is at the bottom of the line and very few earn high revenues. As a result many elderly workers earn little satisfaction in their work. Small employment opportunities for the elderly and the lack of income for the elderly working may be a factor that makes the quality of life of the elderly working in the District Kalisat Jember district is not much different from the elderly who do not work.

There was no significant difference in the quality of life of the elderly subjectively based on marital status. However, if viewed based on quality of life according to the domain obtained the result that there is a significant difference in the quality of life of elderly in all domains based on marital status. Elderly couples tend to have a better quality of life across all domains. The results of this study are in line with Kumar et al. (2014) that unmarried elderly people tend to have a lower quality of life. Death of couples in the elderly causes the elderly to experience psychological problems. It takes a person or family who can listen to the noise and provide comfort to the elderly (BKKBN. 2012). Adjustment problems for women after their spouse dies are also more difficult due to reduced income (Hurlock, E. B. 1980).

3.2. The quality of life among elderly according to family support, physical activities and social participation

Based on Table 3, it can be seen that there is no significant difference in subjective quality of life based on physical activity (p = 0.583) because the level of significance is greater than 0.05. There were significant differences in the quality of life of the elderly subjectively based on family support (p = 0.002), social participation (p = 0.003), and elderly sports activities (p <0.001) because the significance level was less than 0.05. Elderly with the support of good families most have good quality of life and very good while elderly with the support of less families mostly have poor quality of life and mediocre. It shows that elderly people with better family support tend to have a better quality of life as well. Elderly who are more active in social participation mostly have good quality of life and very good while elderly who do not follow social activities mostly have poor quality of life and mediocre. It shows that the elderly who are active in social participation tend to have a better quality of life. Most of the elderly who often do sports activities have a good quality of life and very good while the elderly who do not do sports activities mostly have poor quality of life and mediocre. This suggests that the elderly who are more active in doing sports activities tend to have a better quality of life.

Based on Table 4, it can be seen that there are significant differences in the quality of life in all domains based on family support, social participation, and elderly sports activities because the level of significance is less than 0.05. Elderly who have good family support has a higher mean score of quality of life score on all domains. It shows that elderly people with good family support tend to have a better quality of life in the physical, psychological, social, and environmental domains. Elderly people who are active in social participation have a higher mean rank on the physical, psychological, and social domains whereas the less active elderly in social participation have a higher mean rank on the environmental domain. It shows that the elderly who are active in social participation tend to have a better quality of life in the physical, psychological, and social domains whereas the less active elderly in social participation tend to have a better quality of life in the environmental domain. The mean rank of the elderly who frequently performs sports activities has a higher value in the physical and social domains whereas the rare elderly sports activities have higher mean rank values in the psychic and environmental domains. This suggests that the elderly who exercise more often tends to have a better quality of life in the physical and social domains whereas rare elderly people tend to have a better quality of life in the psychic and environmental domains.

Table 3 Subjective Quality of Life among Elderly based on Family Support, Physical Activities and Social Participation

Variable	Quality of Life				Total		Sig.	χ^2
	Poor		Good					
	n	%	n	%	N	%		
Family Support								
Less	8	8	3	3	11	11		
Moderate	18	18	10	10	28	28	0.002*	12.127
Good	19	19	42	42	61	61		
Social Participation								
No	17	17	5	5	22	22		
Yes (passive)	6	6	10	10	16	16	0.003*	11.890
Yes (active)	23	23	39	39	62	62		
Physical Activities								
Light	13	13	19	19	32	32		
Medium	23	23	29	29	52	52	0.583	1.078
Heavy	9	9	7	7	16	16		
Exercise Activities								
Never	34	34	20	20	54	54		
Rarely	7	7	24	24	31	31	<0.001*	15.373
Often	4	4	11	11	15	15		

Note: * significance level at α < 0.05, using Chi Square test

The mean rank of the highest quality domain of life in the elderly who has moderate physical activity in all domains. Based on the level of significance, only the psychic domain (p = 0.014) and social (p =

0.012) are significant. It shows that elderly people with moderate physical activity tend to have a quality of life in all the better domains but only significant in the psychic and social domains.

Table 3 Mean-rank Score of Quality of life according Family Support, Physical Activities and Social Participation

Variable	Domain of Quality of Life							
	Physical		Physic		Social		Environmental	
	Mean Rank	Sig.	*Mean Rank*	Sig.	*Mean Rank*	Sig.	*Mean Rank*	Sig.
Family Support								
Less	42.59		33.59		31.64		43.59	
Moderate	40.20	0.028*	40.96	0.004*	34.52	< 0.001*	35.54	0.002*
Good	56.66		57.93		61.24		58.61	
Social Participation								
No	25.45		19.73		28.45		28.80	
Yes (passive)	52.47	< 0.001*	55.31	< 0.001*	52.97	< 0.001*	60.06	< 0.001*
Yes (active)	58.88		60.18		57.69		55.73	
Physical Activities								
Light	46.56		47.83		43.59		48.59	
Medium	52.50	0.645	57.30	0.014*	58.46	0.012*	55.05	0.156
Heavy	51.88		33.75		38.44		39.03	
Exercise Activities								
Never	42.79		37.27		40.65		37.22	
Rarely	55.71	0.007*	66.55	< 0.001*	59.32	0.001*	67.11	< 0.001*
Often	67.50		64.97		67.73		63.97	

Note: * significance level at α < 0.05, using *Kruskall Wallis test*

Family concern has a huge psychological and physiological impact on the elderly. It provides a sense of well-being for the elderly(Giriwijoyo, 2013). The results of this study indicate that there is a significant difference in the quality of life of the elderly subjectively based on family support. Based on the analysis of family support for quality of life by the domain, it was found out that elderly people with good family support tend to have a good quality of life in the physical, psychological, social, and environmental domains. According to Green and Kreuter in Yenni (2011),family support is included in the enabling factors that can affect a person's behavior and lifestyle to impact their health status and quality of life.

Based on the results of this study also found that the elderly who actively participate in social activities tend to have a subjective quality of life is better as well. The mean rank of active social participation is also higher and significant in all domains of quality of life. According to Supraba (Aziz, 2013) social activities in the elderly can decrease anxiety because the elderly can share with fellow elderly through joint activities in community life. In addition, according to Aziz (Kresnawati, 2011), social activities in the elderly can make elderly have many friends and can do a positive activity and can actualize himself. The results of this study are in line with research conducted by Supraba (Aziz, 2013)which states that with the existence of social activities in elderly life it can improve the quality of life.

The results of this study indicate that there is no difference in subjective quality of life based on physical activity of the elderly. Seniors in Kalisat District Jember Regency mostly still keep to do physical activity in their daily life. Seniors not only stay silent at home but still do activities that are still able to do. According to Kresnawati and Kartinah (Heydarnejad, 2010), the elderly who do not engage in activities in their lives and all served by others would be susceptible to disease. Based on the analysis of quality of life by the domain, the elderly who have physical activity is likely to have better quality in all domains but only significant in the psychic and social domain. According to Setiawan (2013), physical activity can reduce stress, increase self-esteem, and reduce anxiety and depression so as to improve the quality of life of psychic and social domains.

The quality of life of elderly in Kalisat Sub-district of Jember Regency is also related to the activity of the sport. Seniors who exercise more often tend to have a subjective quality of life is better. Based on the results of the analysis between sports activity on quality of life by the domain, it was found that mean rank score in elderly who often do sports activity is highest in physical and social domain while mean rank score in elderly who rarely do sport is highest in psychic and environmental domain. These results are

significant across all domains. Gymnastics elderly are done together can increase social interaction among fellow elderly so that in addition to improving physical health, elderly gymnastics can also improve the quality of life in the social domain. According to Giriwijoyo and Sidik(2013),sports activities in the elderly can maintain independence in everyday life, get better mobility, welfare, enjoyment of life, and a better quality of life. The results of this study are also in line with research conducted by Heydarnejad and Dehkordi (Setiawan, 2013) that sports activity can significantly.

3.3 The difference of quality of life between elderly BKL member and non BKL member

Bivariable analysis of subjective quality of life of the elderly based on BKL membership shown in Table 4 showed that there were significant differences in the quality of life of the elderly subjectively between BKL members and non-BKL members (p = 0.001) because the significance value was less than 0.05. The elderly members of BKL mostly have a good quality of life and very good that is a number of 36 elderly while the elderly are not members of BKL mostly have poor quality of life and mediocre with the number 31 elderly. it shows that elderly BKL members have a better quality of life than elderly non-BKL members.

Table 4. The difference of quality of life between elderly BKL member and non BKL member

Quality of life	BKL member		No BKL member		Total		Sig.	χ^2
	n	%	n	%	n	%		
Poor and mediocre	14	14	31	31	45	45	0.001*	11.677
Good and very good	36	36	19	19	65	65		

Note: * significantat < 0.05, using*Chi Square test*

Based on Table 5, it can be seen that there is a significant difference in the quality of life of the elderly in all domains (p <0.001) between BKL members and non-BKL members because the significance value is less than 0.05. The mean rank of the entire domain of quality of life in elderly members of BKL is higher than the elderly are not BKL members. Therefore it can be concluded that the elderly BKL members have a better quality of life in the physical domain, psychic, social, and environment than the elderly are not BKL members.

This research gets the result that elderly BKL members have subjective quality of life as well as according tophysical domain, psychic, social, and environment better than elderly non BKL member. It

Table 5. The difference of mean rank of score quality of life domain between elderly BKL member and non BKL member

No.	Domain of quality of life	*Mean Rank* BKL member	*Mean Rank* Non BKL member	Sig.
1.	Physical	62.66	38.34	< 0.001*
2.	Physic	67.77	33.23	< 0.001*
3.	Social	63.61	37.39	< 0.001*
4.	Environmental	64.95	36.05	< 0.001*

Note: * significantat α < 0.05, using*Mann Whitney test*

has been explained in the previous discussion that the elderly BKL members have better family support, more active social participation, and have more frequent sports activities than non-BKL members. On the other hand, these variables are also related to quality of life that is better family support, more active social participation, and sports activities are more often associated with a better quality of life as well. This explains that the quality of life of BKL members is better than non-BKL members due to the activities of the BKL group that support better family support, more active elderly social participation, and more frequent elderly exercise activities.

4. CONCLUSION

The conclusion of this research is that education level is the only characteristic variable of respondent that has significant difference to BKL membership. Elderly BKL members in Kalisat Sub-district Jember District have better family support, more active social participation, and have more frequent sports activities than non-BKL members. Physical activity variable between elderly BKL members with elderly non-BKL members did not show any significant differences. Most of the elderly in Kecamatan Kalisat Jember Regency have good quality of life. The environmental domain has the lowest score compared to the other three domains of quality of life. Elderly in Kalisat Sub-district, Jember Regency with higher education tends to have subjective quality of life and according to better domain. The 60-74 age group has a better quality of life in the neighborhood domain than the 75-90 age group. Elderly couples tend to have better quality of life in all domains. Elderly who have better family support, are more active in social participation, and more frequent sports activities tend to have a subjective quality of life as well as by a better domain. Elderly who have physical activity is likely to have a better quality of life but only significant in the psychic and social domain. Elderly members of BKL tend to have a subjective quality of life and according to a better domain than the

Based on the above conclusions, suggestions that can be given to the elderly are expected to remain active in social activities in the community and still maintain fitness by exercising regularly. For outgoing elderly, it is advisable to continue to provide support and establish good communication towards the elderly and more active role in BKL activities as cadres or as members. Suggestions that the writer can give to the manager of BKL and DPPPAKB Jember is to improve the cadre's guidance to increase the skills and knowledge of the cadre and it is hoped that the BKL cadre meeting can be held to share information about the implementation of BKL activities. Kader is expected to be more active in inviting the elderly to participate in BKL activities. Suggestions that writers can give to BKKBN are expected to provide training to BKL managers and can allocate funds as a form of support

ACKNOWLEDGEMENTS

This study was conducted with the financial support of National Board of Population and Family Planning, Representative Office of East Java Indonesia. We wish to thank all the elderly who cooperated with the research team.

REFERENCES

Aziz, Abdul. 2013. 19 Keys *Happy, Healthy, Wealthy-19 kunci hidup bahagia, sehat, dan sejahtera.* Jakarta: Erlangga.

Badan Pusat Statistik. 2015a. *Statistik Penduduk Lanjut Usia 2014.* Jakarta: Badan Pusat Statistik. http://www.bappenas.go.id/files/data/Sumber_Daya_Manusia_dan_Kebudayaan/Statistik%20Penduduk%20Lanjut%20Usia%20Indonesia%202014.pdf.

BKKBN. 2012. *Kualitas Penduduk Lansia terhadap Partisipasi Kerja di Kota Medan Provinsi Sumatra Utara.* Jakarta: Direktorat Analisis Dampak Kependudukan BKKBN. http://www.bkkbn.go.id/kependudukan/.

BKKBN. 2015. *Kesiapan Kelompok Kegiatan Bina Keluarga Lansia: Menuju Lansia Tangguh.* Jakarta: Pusat Penelitian dan Pengembangan KB-KS Badan Kependudukan dan Keluarga Berencana Nasional. http://www.bkkbn.go.id/litbang/.

BKKBN. 2016b. *Lansia Tangguh dengan Tujuh Dimensi*. Surabaya: BKKBN Provinsi Jawa Timur.

Datta, D., Datta, P. P., Majumdar, K. K. 2015. Role of Social Interaction on Quality of Life. *National Journal of Medical Research*. [serial online]. http://njmr.in/home/download/557.

Fatmah. 2010. *Gizi Lanjut Usia*. Depok: PT Gelora Aksara Pratama.

Giriwijoyo, S. dan Sidik, D. Z. 2013. *Ilmu Kesehatan Olahraga*. Bandung: PT Remaja Rosdakarya Offset.

Heydarnejad, S. dan Dehkordi, A. H. 2010. The Effect of an Exercise Program on Health Quality of Life in Older Adults. *Danish Medical Buletin*, 57(1):1-4. [serial online]. http://www.danmedj.dk/portal/pls/portal/!PORTAL.wwpob_page.show?_docname=4214605.PDF.

Hurlock, E. B. 1980. *Psikologi Perkembangn: Suatu Pendekatan Sepanjang Rentang Kehidupan*. Jakarta: Penerbit Erlangga.

Indrayati, Rita. 2013. Faktor-Faktor yang Mempengaruhi Partisipasi Masyarakat dengan Pelayanan Kesehatan di Pusat Kesehatan Masyarakat Tembilahan Hulu Kabupaten Indragiri Hilir. *Tugas Akhir Gelar Magister*. Jakarta: Universitas Terbuka. [serial online]. http://arsip.ut.ac.id.

Kresnawati, I. dan Kartinah. 2011. Hubungan Dukungan Keluarga dengan Keaktifan Lansia (Lanjut Usia) dalam Mengikuti Kegiatan di Posyandu Lansia Desa Goniran Kecamatan Kartasura. *Artikel Ilmiah*. Surakarta: Universitas Muhammadiyah Surakarta. [serial online]. https://publikasiilmiah.ums.ac.id/.

Kumar, G., Majumdar, A., dan Pavithra. 2014. Quality of Life (QOL) and Its Associated Factors Using WHOQOL-BREF Among Elderly in Urban Puducherry, India. *Journal of Clinical and Diagnostic Research*, 8(1): 54-57. doi:10.7860/JCDR/2014/6996.3917. [serial online]. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3939587/.

Kuswardani, I. H. 2009. Gambaran Peranan Keluarga terhadap Perilaku Hidup Sehat Lanjut Usia di Wilayah Kerja Puskesmas Darussalam Kecamatan Medan Petisah tahun 2009. *Skripsi*. Medan: Universitas Sumatra Utara. http://repository.usu.ac.id.

McNaughton, Crawford, Ball, dan Salmon. 2012. Understanding Determinants of Nutrition, Phisical Activity, and Quality of Life among Older Adults: the Wellbeing, Eating, and Exercise for a Long Life (WELL) Study. *BioMed Central*, 10(1):1-7. doi:10.1186/1477-7525-10-109. [serial online]. http://hqlo.biomedcentral.com/articles/10.1186/1477-7525-10-109.

Nugroho, W. 2012. *Keperawatan Gerontik dan Geriatrik Edisi 3*. Jakarta: Penerbit Buku Kedokteran EGC

Padila. 2013. *Keperawatan Gerontik.* Yogyakarta: Nuha Medika.

Rohmah, A. I. N., Purwaningsih, dan Badriyah, K. 2012. Kualitas Hidup Lanjut Usia. *Jurnal Keperawatan*, 3(2):120-132. [serial online]. http://ejournal.umm.ac.id/index.php/keperawatan/article/view/2589.

Setiawan, G. W., Wungow, H. I., dan Pangemanan, D. H. 2013. Pengaruh Senam Bugar Lanjut Usia (Lansia) terhadap Kualitas Hidup Penderita Hipertensi . *Artikel Ilmiah*. Manado: Universitas Sam Ratulagi. [serial online]. Universitas Sam Ratulagi. [serial online]. http://ejournal.unsrat.ac.id/index.php/ebiomedik/article/download/3632/3159.

Skevington, S. M., Lotfy, M., dan O'Connell, K. A. 2004. The World Health Organization's WHOQOL:BREF Quality of Life Assessment: Psychometric Properties and Result of the International Field Trial a Report from the WHOQOL Group. *Kluwer Accademic Publisher*, 13: 299-310. [serial online]. http://download.springer.com/static/pdf.

Stanley, M. dan Beare, P. G. 2007. *Buku Ajar Keperawatan Gerontik*. Jakarta: EGC.

Supraba, N., P. 2015. Hubungan Aktivitas Sosial, Interaksi Sosial, dan Fungsi Keluarga dengan Kualitas Hidup Lanjut Usia di Wilayah Kerja Puskesmas I Denpasar Utara Kota Denpasar. *Tesis*. Denpasar: Universitas Udayana. http://www.pps.unud.ac.id/thesis/pdf_thesis/unud-1479-1094552982-tesisfinal_nandini.pdf.

Tamher, S. dan Noorkasiani. 2009. *Kesehatan Usia Lanjut dengan Pendekatan Asuhan Keperawatan.* Jakarta: Salemba Medika.

Welis, W. dan Rifki, M. S. 2013. *Gizi untuk Aktifitas Fisik dan Kebugaran*. [serial online]. http://repository.unp.ac.id/489/1/BUKU%20PETUNJUK%20GIZI%20UNTUK%20AKTIFITAS%20FISIK.pdf.

Wikananda, G. 2017. Hubungan Kualitas Hidup dan Faktor Resiko pada Usia Lanjut di Wilayah Kerja Puskesmas Tampaksiring I Kabupaten Gianyar Bali 2015. *Artikel Penelitian*. Denpasar: Universitas Udayana. [serial online]. http://isainsmedis.id/.

Yenni. 2011. Hubungan Dukungan Keluarga dan Karakteristik Lansia dengan Kejadian Stroke pada Lansia Hipertensi di Wilayah Kerja Puskesmas Perkotaan Bukittinggi. *Tesis*. Depok: Universitas Indonesia. http://lib.ui.ac.id/file?file=digital/20282740-T%20Yenni.pdf.

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http://uphec.fkm.uad.ac.id/