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Effect of demographic factors on attitudes to purchase children's supplement products

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ABSTRACT

Children's supplements are products widely offered by drug manufacturers. Their benefits and uses are essential for supporting the growth and health of children. Nevertheless, there is a lack of research in Indonesia examining the relationship between parental demographic factors and attitudes towards purchasing children's supplements. This study employs a mixed-method approach to investigate the impact of demographic factors on attitudes toward purchasing children's supplement products, aiming to fill the research gap. A total of 124 parents from diverse backgrounds participated as respondents, with 29.8% being male and 70.2% female. Their education levels ranged from high school (7.3%), bachelor's degree (26.6%), master's degree (50%), to doctoral degree (16.1%). The results of the regression analysis indicate that only income level plays a positive role in shaping attitudes towards purchasing children's supplements. Notably, 89.5% of respondents believe in the benefits of these supplements. This study highlights the influence of income level on buying attitudes regarding children's supplements. Future research should consider a larger sample size to better represent the population.

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1. INTRODUCTION

The dietary habits established during childhood significantly impact one's health in adulthood. Ensuring an adequate intake of essential macro and micronutrients aligns with the principles of good nutrition. Many individuals recognize the importance of dietary supplements for both children and adults [1]–[3]. According to the food drug administration (FDA), a dietary supplement is defined as a product (excluding tobacco) intended to augment the nutritional content of a food item, containing one or more of the nutritional components found in that food [4]. Similarly, the European Commission defines supplements as food ingredients meant to complement the regular diet, fulfilling an individual's nutritional requirements [5]. This study aimed to investigate whether parents' demographic factors influence their attitudes towards purchasing supplements for their children.

Numerous types of dietary supplement products are available on the market, prompting several studies to investigate the reasons, knowledge, attitudes, and practices regarding their usage [6]–[9]. Approximately 4.4% of the supplement market is targeted at children [10]. Despite this, research on supplement intake among children remains limited [11]–[15], especially when compared to studies on pregnant women, athletes, nutritionists, and pharmacists [9], [16].

From a societal perspective, it is crucial to determine the volume of dietary supplements consumed and the specific products chosen by caregivers. This information is important as the supplements available in the market may require appropriate labeling or could be subject to counterfeiting. Some products may even contain more bioactive ingredients than what the manufacturer's label indicates [17], [18]. A similar situation was highlighted by Arakai, who found that the actual amount of vitamin D in a recommended dose was 1,000 times higher than what the product label suggested [19]. This poses a risk to children, potentially leading to hypercalcemia, hypercalciuria, and kidney problems [20], [21].

Children are a demographic that may be targeted for supplement products since they do not make purchasing decisions independently [22]–[24]. Children can be vulnerable to deceptive marketing practices [25], [26] due to their distinct metabolic processes responsible for the metabolism and elimination of substances [27], [28]. Moreover, children have diverse dietary needs.

In recent years, the global use of dietary supplements among children and adolescents has been on the rise. Binns *et al.* [29] have examined the sociodemographic characteristics of children who use supplements across various regions, including Australia [30], Europe [12], [31], [32], America [12], [33], and Asia [30], [34], [35]. Typically, parents who provide supplements to their children tend to have higher education and more stable socioeconomic backgrounds, while the children themselves may be more likely to have chronic illnesses [12], [30]–[32], [34], [35].

Research has identified factors such as age [36]–[39], gender [17], [34], weight status, body composition [40], socioeconomic status [34], [37], level of physical activity [40], [41], quality of diet [40], [42], and parental supplement use [36] to be associated with the use of multivitamin/mineral supplements in children. However, further research is needed in Indonesia to enhance our understanding, and this study was designed to fill this knowledge gap by examining the role of sociodemographic factors in parents' attitudes towards purchasing additional supplements for their children.

2. METHOD

2.1. Design

This study employed a mixed-method explanatory sequential design. Quantitative research findings were complemented by qualitative data. Quantitative research utilized cross-sectional surveys, while qualitative research involved data collection through focus group discussions.

2.2. Participants

The research employed purposive sampling, specifically targeting parents with children aged one year or older. Before their participation, informed consent was obtained to ensure that respondents voluntarily chose to take part. The questionnaire was distributed online via Google Forms through various platforms such as WhatsApp groups and other social media channels. To determine the sample size, we utilized the G*Power application, a tool capable of estimating an appropriate sample size [43], [44]. According to the power analysis results, we obtained a sample of 124 participants with an effect size of 0.8. G*Power functions as a versatile tool for conducting statistical power analyses across different types of tests, including t tests, F tests, χ^2 tests, z tests, and certain exact tests [45], [46]. Moreover, G*Power can calculate effect sizes and visually represent the outcomes of power analyses. The study involved 124 respondents with diverse characteristics. Among them, 29.8% were male, while 70.2% were female. Regarding their educational background, 7.3% had completed high school, 26.6% held bachelor's degrees, 50% master's degrees, and 16.1% had earned doctoral degrees.

2.3. Measurement

Demographic information, including gender, education level, income, occupation, and the number of children, was gathered. Furthermore, to assess parents' attitudes towards purchasing children's supplements, an attitude scale was utilized. We evaluated content validity through expert judgment. We engaged three experts to assess the research questionnaire we created. Based on the input from these experts, we improved the questionnaire items used. We also conducted a reliability test using Cronbach's alpha internal consistency method, resulting in an alpha coefficient of $\alpha=0.858$. This alpha coefficient indicates excellent reliability scores.

2.4. Data analysis

Quantitative data analysis encompassed descriptive statistics and regression analysis using the stepwise method to test the hypotheses presented in this study. Qualitative data were subjected to thematic analysis. SPSS 16 was utilized for processing quantitative data.

2.5. Research ethics

This research was approved by the Ahmad Dahlan University Research Ethics Committee (Ethical Number: 012207078 KEP UAD). All participants provided their consent to partake in the study and signed a voluntary consent statement. The confidentiality of all participants was ensured throughout the study.

3. RESULTS AND DISCUSSION

3.1. Results

The normality and multicollinearity tests were conducted prior to the hypothesis test analysis. The analysis results indicated the absence of multicollinearity in the data, while demonstrating data normality. Table 1 displays the results of the assumption tests. The results of this study indicate that the regression model tested is significant. Income level, education, type of work, gender, and the number of children all contributed to the attitude of buying children's supplements ($R=.207$, $F=4.68$, $df=2$, $p=.012$). Table 2 presents the F value, R-value, and R square.

Table 1. The result of normality and multicollinearity

Model	Normality	Tolerance	VIF	df	p
1	0.13	1.000	1.050	2	.021

Table 2. The result of R, adjusted R square, F value, and significance

Model	R	R Square	F	df	p
1	.207	.043	4.68	2	.012

Meanwhile, Table 3 presents the mean, standard deviation, and correlations between variables. The correlation analysis revealed a positive association between income and the attitude towards purchasing children's supplements ($r=.207$, $p=.010$). While there were no significant correlations observed between the level of education, the number of children, the type of work, and gender with attitudes toward purchasing children's supplements.

Table 4 displays the outcomes of the role regression analysis, depicting the impact of each predictor on children's supplement-buying attitudes. The findings in Table 4 reveal that only income exerts a positive influence on attitudes towards purchasing children's supplements. Specifically, as parents' income level increases, their attitude towards buying children's supplements becomes more positive.

Table 3. The result of mean, standard deviation, dan intercorrelation

Measure	M	SD	1	2	3	4	5	6
Attitude	32.2	4.9	1.000					
Education	2.75	.8	-.036	1.000				
Income	4.3	2.3	.207**	.458	1.000			
Gender	1.7	.45	.027	-.180	-.124	1.000		
Job type	1.8	1.1	-.044	-.561	-.160	.159	1.000	
Child number	2.1	.8	-.015	.101	.147	-.092	.112	1.000

$p < 0.05$

Table 4. The result of standardized beta

Variable	β	t	p
Wage	.207	2.343	.021
Education	-.166 ^b	-1.676	.096
Gender	.054 ^b	.604	.547
Job type	-.011 ^b	-.120	.905
Child number	-.046 ^b	-.512	.609

Note: $R^2=.090$ ($N=97$), $p=.000$.

In addition to testing the hypothesis, this study also generated descriptive findings concerning attitudes towards purchasing children's supplement products. We present each descriptive finding related to the buying attitudes of children's supplements tailored to the research questions. Respondents have the option to select multiple reasons in response to the questions.

The descriptive results in Figure 1 illustrate the factors influencing parental decision-making when purchasing children's supplement products. The foremost consideration, cited by 86% of respondents, is the perceived benefits of the supplement's ingredients, followed by the product's overall quality (75%) and recommendations from other individuals (51%). These findings suggest that parents primarily evaluate

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children's supplement products based on the benefits offered by their ingredients, emphasizing the importance of valuable content for children when making a purchase decision.

Figure 2 provides a visual representation of the main reasons why parents buy supplement products for their children, depending on their specific goals. The most common motivation, with 91% of respondents, is to maintain and preserve the health of their children. This suggests that the majority of parents view supplements as a means to ensure their children's overall well-being. The second most prevalent motivation, cited by 43% of respondents, is the use of supplements to treat existing illnesses in their children. This indicates that a significant portion of parents see supplements as a potential remedy for health issues their children may be facing. Lastly, 14% of respondents mentioned using supplement products as a way to prevent future illnesses in their children. This suggests that a smaller but still notable portion of parents proactively turn to supplements as a preventive measure against potential health problems. Figure 2 highlights that the primary motivation for parents in purchasing supplement products for their children is to maintain their health, followed by using supplements as a treatment, and, to a lesser extent for preventive purposes.

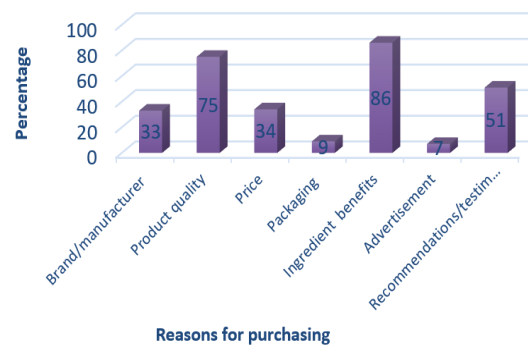


Figure 1. Basic reasons for purchasing children's supplement products

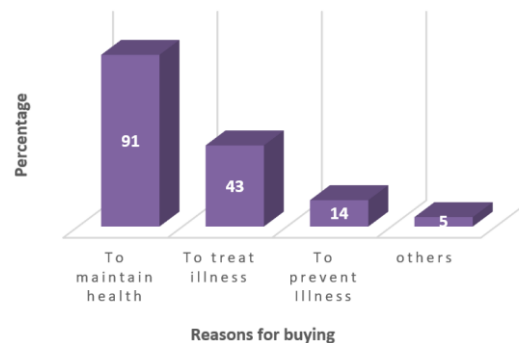


Figure 2. Reasons for considering buying supplement products

The next question is related to the types of supplement products that parents frequently purchase. The majority of parents (80.6%) chose vitamin supplements as their preferred product. Following closely were mineral supplements, selected by 36.3% of parents, and omega-3 products, preferred by 34.7% of parents. Herbal products were also commonly selected, with 30.3% of parents indicating a preference for them. Figure 3 displays the results for the types of supplement products purchased by parents.

In the context of parents seeking information about children's supplement products, there are four sources from which parents acquire information. The most prominent of these sources are doctors, who exert a significant influence with a preference rate of 46%. This reflects the high level of trust parents place in medical professionals for guidance and recommendations regarding their children's health. Closely following this, product advertisements hold the second position, with 42% of parents considering them a source of information. This suggests that marketing and promotional materials play a substantial role in shaping parents' perceptions and decisions regarding these products. In third place are recommendations from friends, which have a 36% influence, indicating that the experiences and advice of peers also carry weight in parental decision-making.

Finally, magazines, newspapers, tabloids, and online media collectively have the least influence at 31%, signifying that a smaller proportion of parents turn to these sources for information on children's supplement products. Figure 4 provides a visual representation of the main sources of information obtained by parents.

Figure 5 provides a visual representation of the patterns in which parents purchase supplements for their children. The majority of parents, constituting 55% of the respondents, buy supplements for their children on a monthly basis. This indicates that a significant portion of parents regularly purchase these products for their children's health needs. Following monthly purchases, the second most common frequency is weekly, accounting for 27%. This suggests that a substantial portion of parents prefer to buy supplements on a weekly basis. In contrast, less common options include purchasing supplements once every two weeks and once every two months, each accounting for 10% of the respondents. This implies that these less frequent purchase intervals are not as popular among the surveyed parents.

In terms of parental beliefs regarding the advantages of child supplements, the majority (89.5%) believe in these benefits. A smaller percentage (9.7%) mentioned being unaware of the advantages of children's supplements. Additionally, a minority of parents (1.3%) expressed skepticism regarding the benefits of children's supplements. Figure 6 presents the results of parental beliefs in the advantages of children's supplements, providing a visual representation of parents' perceptions of the benefits of these supplements.

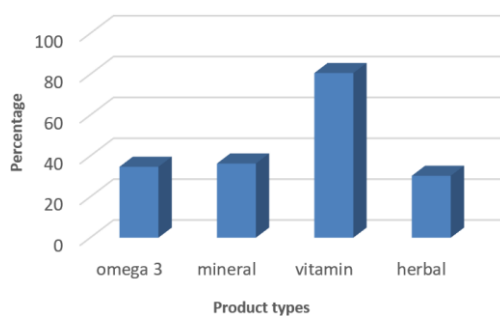


Figure 3. Product types of supplements purchased

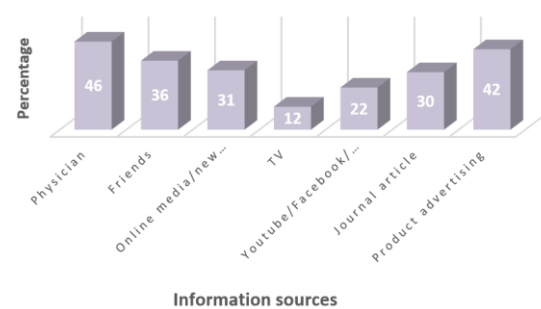


Figure 4. Sources of information related to children's supplements

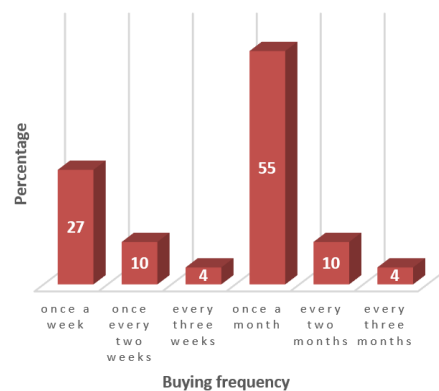


Figure 5. Frequency of buying children's supplements

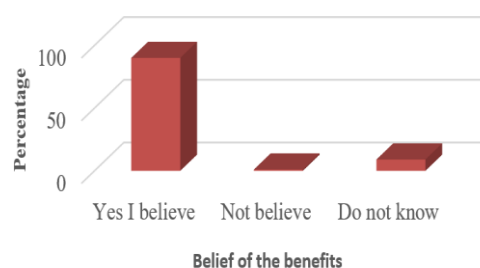


Figure 6. Belief in the benefits of children's supplements

3.2. Discussion

The research findings indicate that income level, education, type of work, gender, and the number of children all play a role in shaping attitudes toward purchasing children's supplements. Among the various demographic variables studied, it was observed that only income levels exhibited a positive correlation with attitudes toward buying children's supplements ($r=.207$, $p=.010$). This aligns with prior research findings suggesting that parents of children who receive supplements often possess well-established socioeconomic characteristics [12]–[14], [30]–[32], [34], [35], [47]. Disparities in income levels and needs impact the frequency of supplement purchases, with respondents reporting monthly purchases (54.8%), weekly purchases (26.6%), bi-weekly or bimonthly purchases (9.7%).

Interestingly, the level of education was found to have no significant effect on supplement purchases, contrary to previous findings indicating that parents of supplement-receiving children typically have higher education levels and well-established socioeconomic characteristics [12], [30]–[34], [15], [35], [45]. In contrast to prior research that suggested gender might influence children's supplement purchases [17], [34], our study found no such impact. Nevertheless, in specific instances, gender did not demonstrate a significant effect, such as in the case of certain vitamin D supplements [33].

Demographic variables contributed to 43% of the variation, leaving 57% unexplained by this research. Other factors believed to exert influence but not examined in this study include age [13], [36]–[39], weight status [13], [14], [42], physical activity level [40], [41], diet quality [40], [42], parental supplement use [36], ethnicity or race [40], maternal breastfeeding status [30], non-smoking parental status [15], urban residency status [33], and musculoskeletal conditions or cognitive level [43]. The advent of information technology has heightened awareness regarding the importance of meeting children's nutritional needs, including information about supplement nutritional content. Similarly, parenting style can impact children's nutritional well-being [46].

Parents primarily base their assessment for purchasing children's supplement products on the perceived benefits of the supplement content (86.3%), followed by the quality of the supplement product (75%), and recommendations from others (51.6%). Supplements are valued for their ability to supplement children's nutritional needs, increase appetite, prevent stunting and developmental disorders, and enhance nutrient absorption in children with specific conditions. Confidence in the benefits of supplement content is bolstered when comprehensive nutritional information is available on the product packaging. This is consistent with previous research, which indicated that the most commonly perceived benefits of supplements include support for overall health or well-being (63.5%) and improved cognitive performance (49.3%) [45]. Respondents who considered supplement products safe and natural were more likely to use them [45]. Nevertheless, errors in supplement production and labeling can pose risks of side effects [19].

The primary reason for purchasing supplement products was to maintain children's health (91.1%), followed by prevention of illness (42.7%) and treatment of illness (13.7%). Given that children remain vulnerable to health issues due to ongoing organ development, preserving children's health is of utmost importance. Health problems or specific diseases in children can significantly impact their quality of life and daily functioning. For instance, the recent rise in cases of acute kidney failure among children aged 6 months to 18 years, with most cases occurring in those aged 1-5 years, underscores the significance of health maintenance [48]. Thus, enhancing immunity through supplements is a key preventive measure.

Treating diseases typically incurs higher costs than health maintenance. Children with existing health concerns tend to use supplements more frequently. Supplements are employed for both prevention and treatment purposes [12]. Parents or caregivers commonly purchase food supplements for their children to boost immunity (43.6%) and support rapid growth (36.5%) [35]. Chronic diseases also drive the use of supplements [13].

The majority of parents favored vitamin supplements (80.6%), followed by mineral products (36.3%), omega-3 products (34.7%), and herbal products (30.3%). Vitamins encompass a wide range of micronutrients, including vitamins A, B complex, C, D, E, and K, each offering distinct benefits. Vitamins are readily available at affordable prices, with demand surging during the pandemic. Minerals, comprising iron, manganese, potassium, calcium, zinc, sodium, magnesium, chloride, copper, and iodine, complement vitamins. The critical roles played by vitamins and minerals make them the most commonly used types of supplements [12], [13], [15], [30], [35], [36].

Herbal products, which may include honey, dates, black cumin seeds (habbatussauda'), and spices, are believed to have various benefits. Herbal remedies are widely employed, but it is important to note that responsible manufacturing is essential. Some producers irresponsibly add medicinal chemicals to herbal supplement products. While there is substantial promotion of herbal medicine use, evidence-based information on the efficacy and safety of these products still requires improvement [47]. Clinical trials of herbal products are still in development, necessitating standardized dosages. In certain instances, side effects may occur, including allergic reactions or digestive issues as a result of using herbal supplements.

Peers, both within interpersonal relationships and in community support groups, serve as significant sources of support that can influence attitudes. Mass media and social media, including exposure to advertisements, offer easily accessible sources of information without time or location constraints. Access to diverse and accurate information can enhance parental knowledge regarding the benefits of food supplements [3]. Nevertheless, students are often exposed to information that does not adhere to nutritional guidelines. Stricter oversight of promotional materials related to food is required to ensure that schools provide a health-promoting food environment [26].

The majority of respondents expressed belief in the benefits of children's supplements (89.5%), while a small percentage indicated a lack of awareness regarding these benefits (9.7%), and only a few parents expressed skepticism about the benefits (1.3%). This aligns with previous findings suggesting that parents who provide dietary supplements to their children are more likely to trust these products [32]. However, those who lack confidence in the benefits of supplements may require clarification when making choices about using children's dietary supplements [35].

Busy parents with limited time may find it challenging to prepare healthy meals, and children may gravitate toward easily accessible but unhealthy foods, such as junk food. Meeting nutritional needs solely through natural foods may be less reliable in today's environment [21]. Faced with this dilemma, considering the use of children's supplements becomes inevitable.

Focus group discussions revealed that most parents attending believed in the effectiveness of supplements. They reported purchasing children's supplements at least monthly or on the advice of a doctor. Parents considered supplements essential for providing additional nutrition that might not be fully met through regular food consumption. This is particularly relevant when children are reluctant to eat vegetables and fruits. Hence, supplements are used to bridge nutritional gaps in the daily diets of children. Here are some statements from parents.

"In my opinion, supplements are necessary for children, because children often find it difficult to eat, ... sometimes they do not want to eat fruits and vegetables..." (Respondent 1)

"In my personal opinion, ... children's supplements need to be purchased, ... at least once a month ... to meet children's nutritional adequacy ..." (Respondent 2)

"I think children's supplements are also important ... because sometimes the nutritional adequacy of the food children eat may not be optimal ..." (Respondent 2)

Nevertheless, this study has limitations, specifically the small sample size of 124 respondents, despite their diverse backgrounds. Future research should aim to increase the sample size significantly, ideally ranging from 500 to 1,000 respondents, in order to thoroughly investigate the impact of demographic factors on children's attitudes towards supplement purchases. The adequacy of statistically representative samples will play a crucial role in achieving meaningful results and ensuring the generalizability of the research findings.

4. CONCLUSION

The study's findings reveal a positive correlation between income levels and parents' attitudes towards purchasing children's supplements. Specifically, as income levels increase, parents tend to hold more favorable attitudes regarding buying these supplements. In contrast, no significant correlations were found between attitudes towards purchasing children's supplements and other demographic variables. Qualitative data from focus group discussions indicated that a majority of parents considered purchasing supplements for their children as essential. They cited reasons such as supplementing children's nutrition, maintaining their health, and promoting optimal physical growth. These findings hold significant implications, particularly for businesses in the health supplement industry. They suggest opportunities to contribute to public health improvement without the need for strict demographic controls, such as parental age, sex, or education level. Instead, businesses should focus on income levels to tailor supplement variants to consumers' purchasing power. Public education should emphasize the benefits of supplements, drawing from empirical research results, while also ensuring clear presentation of product benefits and nutritional compositions on product packaging.

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