

# Correlation of age, education, employment status, parity and mastitis history with the incidence of mastitis

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**Correlation of age, education, employment status, parity and mastitis history with the incidence of mastitis**

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Original Article

**ABSTRACT**

**ARTICLE INFO**

**Keywords:**

Age,  
Education,  
Employment Status,  
Parity,  
Mastitis History,  
Mastitis

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DOI : 10.20885/JKKI.Vol9.Iss3.art5

**History:**

Received: December 12, 2016

Accepted: October 23, 2018

Online: December 31, 2018

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**Background:** The national coverage of exclusive breastmilk did not reach its target in 2014. One reason behind this was due to the swelling of the breast to mastitis condition. Hence the baby was not getting enough breastmilk. World Health Organization WHO estimates the mastitis case between 2.6 and 33 %, with global prevalence around 10% of all breastfeeding women. In 2014, Panembahan Senopati Bantul Yogyakarta Hospital documented 5.3% women with mastitis and 4.2% in 2015.

**Objective:** This research aims to evaluate the correlation of ages, education, employment status, parity, and mastitis history with mastitis case in Panembahan Senopati Bantul Yogyakarta Hospital.

**Methods:** This research was an observational analytic with a case-control design. Data analytic was performed using the Chi-Square test.

**Results:** The results of bivariate analysis showed that age (OR = 0.673; 95% CI; 0.345-1.314), education (OR = 1.288; 95% CI; 0.678-2.44), employment status (OR = 1.368; 95% CI; 0.749 -2.497), and parity (OR = 0.829; CI 95%; 0.455-1.511) did not have a significant correlation with the incidence of mastitis, but the history of mastitis showed a significant association with the incidence of mastitis (OR = 2.280; 95% CI; 1.112-1.674 ).

**Conclusion:** There was a correlation between the history of mastitis with the recurrence of mastitis in Panembahan Senopati Bantul Yogyakarta Hospital.

**Latar Belakang :** Cakupan pemberian ASI eksklusif secara nasional tahun 2014 tidak mencapai target. Prevalensi global kejadian mastitis cukup tinggi sekitar 10% dari perempuan yang menyusui. Kejadian mastitis di RSUD Panembahan Senopati Bantul Yogyakarta cukup tinggi yaitu 5,3% pada tahun 2014 dan pada tahun 2015.

**Tujuan:** Penelitian ini bertujuan untuk mengetahui hubungan umur, pendidikan, pekerjaan, paritas dan riwayat mastitis dengan kejadian mastitis di RSUD Panembahan Senopati Bantul Yogyakarta.

**Metode:** Penelitian ini menggunakan rancangan case control. Responden dalam penelitian ini adalah ibu nifas dengan mastitis sebanyak 64 pasien dan ibu nifas normal sebanyak 128 orang. Perbandingan sampel menggunakan 1:2. Sampel diambil menggunakan teknik pengambilan simple random sampling. Data berupa umur, pendidikan, pekerjaan, paritas, dan riwayat mastitis dicatat berdasar data sekunder rekam medik RSUD Panembahan Senopati. Analisis data menggunakan uji Chi Square.

**Hasil:** Hasil analisis bivariat menunjukkan bahwa umur (OR=0,673;CI 95%; 0,345-1,314), pendidikan (OR=1,288; CI 95%; 0,678-2,44), pekerjaan (OR=1,368; CI 95%; 0,749-2,497), dan paritas (OR=0,829; CI 95%; 0,455-1,511) tidak mempunyai hubungan yang bermakna dengan kejadian mastitis. Pendidikan tidak

*mempunyai hubungan yang bermakna dengan kejadian mastitis. Pekerjaan tidak mempunyai hubungan yang bermakna dengan kejadian mastitis. Paritas tidak mempunyai hubungan yang bermakna dengan kejadian mastitis. Riwayat mastitis mempunyai hubungan yang bermakna dengan kejadian mastitis (OR=2,280; CI 95%; 1,112-1,674).*

**Kesimpulan:** Terdapat hubungan riwayat mastitis dengan kejadian mastitis di RSUD Panembahan Senopati Bantul Yogyakarta.

## INTRODUCTION

Mother's breast milk is a white liquid secreted by the mammary gland after delivering a baby. This liquid plays a role as the primary natural food for babies, especially in their first six months of life without adding any other drink or food, which is called the exclusive breastfeeding period.<sup>1</sup> In 2014, the national coverage of exclusive breastfeeding was only 52.3%. This number was failed to achieve the national target which was 80%.<sup>2</sup> Meanwhile, the regional coverage of exclusive breastfeeding in DIY Province in 2013 was 51.6%, an increase from the previous year which was 46.4%.<sup>3</sup>

The World Health Organization (WHO) estimates the incidence of mastitis is around 2.6% to 33%, with the global prevalence is 10% among breastfeeding women.<sup>4</sup> It has been reported that 10% to 20% of mastitis occurs in the first six months of postpartum, especially on the first eight weeks. However, mastitis can also happen at any time during breastfeeding, and around 3% of women with untreated mastitis may develop a complication such a breast abscess.<sup>5</sup>

The failure to provide exclusive breastfeeding is often caused by the specific medical condition, such as the blockade of mammary gland under the nipple. This can cause a decrease in milk ejection. Therefore, the babies do not get enough milk. If left untreated, this particular condition can lead to inflammation of the gland called mastitis. This condition can be worsened by the less frequent nursing time, hence more inflammation and less milk produced.<sup>6</sup> Mastitis often caused by microbes, especially *Staphylococcus aureus*

which travels through nipple cracks or blood circulation.<sup>7</sup>

Several known predisposing factors may affect mastitis event such as age, parity, previous history, employment status, education, childbirth techniques as well as breastfeeding techniques including nursing frequency.<sup>4,8</sup> Based on a preliminary study in Penembahan Senopati Hospital Bantul in 2014, from the total of 849 postpartum mothers, there were 5.3% women suffered from mastitis. Almost similarly, data set in 2015 documented from overall 742 postpartum women, there was 4.2% women with this breast condition. Based on the description, the researcher wanted to evaluate the correlation between age, education, occupation, parity, and history of mastitis with the incidence of mastitis in Panembahan Senopati General Hospital Bantul Yogyakarta.

## METHODS

This research is an observational analytic study using a case-control design to examine the relationship between specific effects (disease or health condition) and individual risk factors.<sup>9</sup> This study was conducted at Panembahan Senopati Hospital Bantul in September-October 2016.

The subjects of this study were postpartum mothers who were registered and recorded as the outpatient in the medical records of Panembahan Senopati Hospital between 2014 and 2015. The sample inclusion criteria were postpartum mothers with signs and symptoms such as breast tenderness, redness, swelling, fever and clinically diagnosed as mastitis by a doctor. The exclusion criteria are patients with the incomplete medical record. The collected data were based on the subjects age, education, occupation, parity and mastitis history according to secondary data from the medical records of Panembahan Senopati General Hospital. The samples were taken using simple random sampling with the ratio between case and control is 1 to 2.

**RESULT****Characteristics of Respondents**

Table 1 shows the characteristics of respondents in study. The majority of mothers 142(74%) were in the age group 20 to 35 while 50(26%) were in the age group <21 or >35. Among the mothers, 33,3% experienced mastitis condition Based on the education status, most

subjects (69,3%) were graduated from higher education level. However, more than half of the subjects stayed at home mothers (unemployed) as much as 52.1%. According to the parity, the frequency of primipara women was half of the overall subjects, around 51,6%. Majority of them have never had mastitis history (79,7%).

Table 1. Distribution of frequency of age, education, occupation, parity and mastitis history in Panembahan Senopati Bantul Hospital between 2014 to 2015

Characteristics		Frequency(f)	Percentage (%)
Age	20-35 y.o	142	74%
	<21 or >35 y.o	50	26%
Mastitis status	Yes	64	33,3%
	No	128	66,7%
Education	Low	59	30,7%
	High	133	69,3%
Occupation	Yes	92	47,9%
	No	100	52,1%
Parity	Primiparous	99	51,6%
	Multiparous	93	48,4%
Mastitis history	Yes	39	20,3%
	No	153	79,7%

**Bivariate Analysis**

This analysis was performed to evaluate the relationship of age, education, occupation, parity and history of mastitis with the incidence

of mastitis in Panembahan Senopati General Hospital Bantul Yogyakarta. Table 2 displays the results of the bivariate test.

Table 2. Correlation between age, education, employment status, parity and history of mastitis with the incidence of mastitis in Panembahan Senopati General Hospital, Bantul, Yogyakarta between 2014 to 2015

Variables		Mastitis Event				p	OR (Odds Ratio, CI 95%)
		Yes		No			
		F	%	F	%		
Age	Risk	44	31%	98	69%	0,32	0,673 (0,345- 1,314)
	Non risk	20	40%	30	60%		
Education	Risk	22	37,3%	37	62,7%	0,54	1,288 (0,678-2,44)
	Non risk	42	31,6%	91	68,4%		
Employment status	Risk	34	37%	58	63%	0,38	1,368 (0,749-2,497)
	Non risk	30	30%	70	70%		
Parity	Risk	31	31,3%	68	68,7%	0,64	0,829 (0,455-1,511)
	Non risk	33	35,5%	60	64,5%		
Mastitis history	Risk	19	48,7%	20	51,3%	0,036	2,280 (1,112-4,674)
	Non risk	45	29,4%	108	70,6%		

Table 2 presents several variables and the incidence of mastitis. The age variable at risk without mastitis condition is 69%. Similarly, non-risky education variables (women with higher education) without mastitis were 68.4%. This number is only slightly higher than the subjects with the risky educational background (low education level) but without mastitis which was 62.7%. Based on the employment status, the percentage of stay at home mothers without mastitis is higher compared to the working mothers, 70% and 63% respectively. Meanwhile, first-time mothers (primipara) without mastitis condition is 68.7% and the women who have never had mastitis without current state was 70.6%.

The Chi-square analysis performed on these variables showed that there was no relationship between age, education level, employment status, as well as parity with the incidence of mastitis. They were shown from the p-value of each variable which was more significant than 0.05. Besides, the confident interval (CI) for each odds ratio (OR) value included 1. Therefore those variable is meaningless regarding risk or the protective factors of mastitis condition.

On the other hand, the Chi-square analysis on the mastitis history showed a significant relationship between this variable to the mastitis incidence (p value = 0.036). Additionally, OR value of 2.280 (95% CI; 1.112-1.674) means that mothers who have had mastitis history, have 2.28 times greater risk for recurrent mastitis compared to mothers without the history of mastitis.

## DISCUSSION

Bivariate analysis showed that almost all of the research variables including age, education, employment status, and parity have no association with the incidence of mastitis. However, we found that mastitis history was significantly correlated with the recurrent mastitis.

Maternal age that is considered at risk of mastitis is in the range of 21-35 years, which refers to the good reproduction age. A

retrospective study showed that women aged 21-35 years more often suffered from mastitis than women on other age groups; below 21 years or over 35 years.<sup>5</sup> However, our results showed there is no association between age and the incidence of mastitis. Hence this variable is not necessarily a protective factor for the condition. It is believed that information about the importance of exclusive breastfeeding and its techniques have been carried out in all of the postpartum patients regardless of their age. The identical information is often given at least twice in the postpartum room to every mother as one of the puerperal programs at Panembahan Senopati General Hospital Bantul. Therefore, we can expect that every mother regardless their age was well-informed in preventing the occurrence of mastitis. This result supports previous studies which stated that age is not a risk factor for breastfeeding problems. Therefore, there is no association between age and mastitis incidence.<sup>10-13</sup>

Regarding the education level, we found that the variable is not associated with mastitis incidence. Hence it is not necessarily a risk factor. In our study, we only assessed for formal education level, because it was first believed that individuals with higher education background tend to have more knowledge compared to them with lower levels of education. However, formal education is not an absolute measure of individual knowledge because there are other various factors influencing knowledge.<sup>14</sup> Generally, breastfeeding knowledge is relatively accessible and available almost every place. As mentioned before, Panembahan Senopati General Hospital provides health education about breastfeeding techniques for each parturition. Therefore, postpartum mothers regardless of their formal education level received the same knowledge about breastfeeding and its problem including mastitis prevention. This result is in accordance with the previous study which stated that formal education level is not a risk factor for breastfeeding problem.<sup>10,12,15</sup>

Employment status is the other variable we examined in this study. Our result showed that

there is no association between the employment status with mastitis incidence. This finding is somewhat unexpected because the working mothers are perceived to have a higher risk of mastitis due to their longer interval in nursing the babies. However, this is untrue because nowadays, working mothers can express their breastmilk regularly using certain breast pumps during the break time in the office. Besides, stay at home mothers have the same risk to experience mastitis depending on their internal motivation to breastfeed the babies. Previous research conducted in the Public Hospital Prof. Dr. Morgono Soekarjo Purwokerto also showed that the p-value 0.52 to the association of employment status to the incidence of mastitis.<sup>5</sup>

The next variable we examined was the parity status. A study suggested that primipara women have a higher risk for breast inflammation due to their immunity status to the *S. aureus*.<sup>16</sup> However, in this study we found that parity status is not associated with mastitis condition. Therefore, there is no difference between primipara and multipara in the possibility of experiencing mastitis.

It is documented that most postpartum mothers with mastitis in the Panembahan Senopati Hospital are multiparous women. Apparently, our result was in line with another study which suggested that the number of children is not related to the incidence of mastitis.<sup>10</sup> One particular study even showed that multiparous women have a higher risk to experience breastfeeding problems compared to primiparous women (OR: 1.8, 95% CI; 1.1-2.8).

This situation might be due to the lower motivation on the multiparous women in providing breastmilk to their babies. Besides, babies with suckling difficulty will have a harmful impact on their mothers, which makes the mothers even becoming unwilling to breastfeed their babies. Some mothers also perceived that their babies are getting more than enough. Therefore the mothers are more focused on their body shape.<sup>6</sup> However, these claims need further confirmation of our subjects.

Different from our other variables, the history

of mastitis, showed a correlation between the history of mastitis and the recurrence of its condition. This is probably due to the same mistakes the mothers made, for instance, their unimproved breastfeeding technique.<sup>16</sup> Recurrent mastitis is often caused by inadequate treatment or the mothers were having risky behaviour, or habit which leads to static milk flow.<sup>5</sup> Although postpartum mothers have received a handful of breastfeeding information during the puerperium stage, it is believed that the fatigue and stressful conditions may hinder the information processing. Therefore, the mothers need families to assist and to support them during the breastfeeding stage.

A finding in other study suggested that recurrent mastitis can occur due to genetic predisposition. Hence, postpartum mothers with this particular genetic arrangement will be more susceptible to their risky behaviour or habit that leads to mastitis.<sup>11</sup> Other study showed that postpartum mothers with a history of mastitis were at risk of recurrence, 3.9 times greater than those who do not have the previous history. A similar study conducted in RSUD Prof. Dr. Margono Seokardjo also stated that the postpartum mothers with current mastitis condition were mostly had a mastitis history (P-value = 0.034). This study supports our finding that mastitis history is the risk factor for the recurrence of this particular breast inflammation.<sup>5</sup>

## CONCLUSION

There is no relationship between age, education, employment status, and parity with the incidence of mastitis in Panembahan Senopati General Hospital, Bantul, Yogyakarta. However, there is a correlation between the history of mastitis and the incidence its recurrence in Panembahan Senopati General Hospital, Bantul, Yogyakarta.

## CONFLICT OF INTEREST

Authors declare that there is no conflict of interest regarding this paper and publication.

### Acknowledgement

Authors would like to thank to management of Panembahan Senopati General Hospital for all support to our research.

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