



The Effect of Pre-Pregnancy BMI and Parity on the Duration of Breastfeeding During Exclusive Breastfeeding

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ABSTRACT

Obesity is a condition of a person who experiences overnutrition, especially fat accumulation which causes the body to weigh more than normal body weight, indicated with a Body Mass Index (BMI) of more than 29.9 kg/m². Several international pieces of research state that obese mothers fail to breastfeed exclusively. Aside from maternal BMI, maternal characteristics also support exclusive breastfeeding. Maternal characteristic factors include age, parity, and mother's education. This study aims to determine the correlation between pre-pregnancy BMI and maternal characteristic factors with the duration of breastfeeding during exclusive breastfeeding. This research is quantitative research using a cross-sectional descriptive-correlational method with a retrospective approach. The number of samples in this research was 300 mothers who met the inclusion criteria with the purposive sampling technique. Data were collected and processed statistically using the Chi-Square test and T-test to determine factors related to breastfeeding duration and the linear regression test with the backward method to determine the most influential factor on breastfeeding duration. The Chi-Square test results showed that all variables were related to the duration of breastfeeding with a p-value <0.05. The linear regression test showed that the factors that had a significant effect on the duration of breastfeeding were pre-pregnancy BMI and parity with a significance of 0.00, judging from the coefficient B factor value of 0.285, parity had a more dominant effect. Pre-pregnancy BMI and parity are the most influential and interrelated variables in exclusive breastfeeding, where primiparous mothers with obesity are more at risk for exclusive breastfeeding failure than obese multiparous mothers.

Keywords: BMI, Exclusive breastfeeding, pre-pregnancy, Parity.

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INTRODUCTION

Obesity is a condition of a person who experiences overnutrition, especially fat accumulation which causes the body to weigh more than normal body weight, indicated with a Body Mass Index (BMI) of more than 29.9 kg/m² according to the Institute of Medicine (IOM). (Farpour-Lambert et al., 2018) states that 55% of women of reproductive age in America are obese and the rate increases 0.5% points per year. (Wojcicki, 2011) states that more reproductive-age women are obese than men in the United States, which has become a global issue in recent years. A similar pattern is also found in Indonesia where the prevalence of women of reproductive age with obesity is 29.3%, which is more than that of obese men that is 14.5% (RISKESDAS, 2018).

Obesity in women can pose several maternal risks for both mothers and their babies. In pregnant women, it can increase the occurrence of gestational diabetes mellitus, hypertension in pregnancy, pre-eclampsia, macrosomia, and labor complications. The risk to a fetus from an obese mother can cause neonatal trauma, such as head trauma and shoulder dystocia, and in the long run can cause childhood obesity (Farpour-Lambert et al., 2018).

(Oddy et al., 2006) states that pre-pregnancy obesity is at risk of pregnancy and labor, which can cause the failure of exclusive breastfeeding, indicated with early cessation of breastfeeding. One of the possible causes of early breastfeeding cessation is the hormonal factors, where the lactogenesis process,

that is the process of breast milk production and secretion, is delayed. Another factor is the difficulty in breastfeeding techniques, such as positioning and attachment. Psychological factors that affect the occurrence of breastfeeding failure are changes in body shape where mothers feel ashamed to breastfeed in public places (Wojcicki, 2011).

According to Rasmussen and Dewey in (Oddy et al., 2006), women with pre-pregnancy obesity have a reduced prolactin response to breastfeeding and an increase in progesterone which interferes with the early lactation process. In general, women with obesity experience a decrease in prolactin response on the seventh day.

According to (Marshall et al., 2019), it is implicated as the cause of delayed lactogenesis which contributes to the dysfunction of lactation due to insufficient breast milk production. An increase in pre-pregnancy BMI and body fat percentage in early pregnancy is linked to a significant reduction in exclusive breastfeeding at 6-week postpartum. (Ramji et al., 2016) states that obese women are less likely to start and continue breastfeeding, due to anatomical differences, low prolactin response, and delays in the process of lactogenesis II.

Several pieces of research on the correlation between obesity and the duration of breastfeeding that has been carried out found other factors that influence exclusive breastfeeding, such as psychological, sociocultural, mother's intention of breastfeeding, and maternal sociodemographic factors. In (Boudet-Berquier et al., 2018), it is stated that the duration of breastfeeding is influenced by the social environment, especially social norms about breastfeeding and public support after comparing the differences in the average duration in several countries. (O'Sullivan et al., 2015) states that multiparous women who are significantly obese are closely related to financial conditions, mother's education, type of delivery methods, and breastfeeding knowledge.

Research on the influence of these factors has also been carried out in Indonesia. (Mabud et al., 2014) states that parity is a factor that correlates with exclusive breastfeeding based on the mother's experience. (Yuliawati et al., 2018) states that a mother's education influences breastfeeding success, the higher the mother's education, the better the knowledge. This is because mothers with higher education know that giving exclusive breastfeeding for their babies is the best choice, according to the information that respondents received from health workers.

It is also possible that maternal age is one factor that influences the success of exclusive breastfeeding. The results of (Conita, 2014) state that mothers who are at healthy reproductive age (20-35 years) have a higher success rate of breastfeeding compared to mothers under 20 years of age, associated with mental maturity and pregnancy-related conditions.

Government Regulation Number 33 the year 2012 recommends that breast milk be given to newborns for up to six months to meet their nutritional needs, without adding and or replacing with other food or drinks (except medicine, vitamins, and minerals). Breast milk is a living liquid containing colostrum which is rich in antibodies because it contains protein for the body's immune system and a high amount of germ killers so that it can reduce the risk of death in infants. Yellow colostrum is produced from the first day to the third day. Breast milk contains less immunoglobulin, protein, and lactose than colostrum but has higher fat and calories with white color from the fourth to the tenth day. Breast milk also contains absorbent substances in the form of separate enzymes that will not interfere with enzymes in the intestines (INDONESIA, 2012)

The success rate of exclusive breastfeeding in Indonesia is quite good, reaching 67.74% and The Special Region of Yogyakarta (DIY Province) has reached 77.50% (RISKESDAS, 2018). However, the exclusive breastfeeding coverage rate in Yogyakarta City has the lowest percentage compared to other districts in DIY, which is 61.1%. The number of exclusive breastfeeding coverage in Yogyakarta has also experienced a decrease from the previous year which was 66.1%. The percentage of obese women of their reproductive age in Yogyakarta is quite high, which is 66% (Dinkes Kota Jogja, 2019).

Based on the above phenomenon, the researchers are interested in proving the influence of pre-pregnancy obesity and maternal characteristic factors on the success of exclusive breastfeeding.

METHOD

This research used a quantitative method with an analytical observational type of research that aimed to get a depiction of a population and find out the correlation between cause and effect or risk factors with effects. The design used for this research was a retrospective cross-sectional design. This research was conducted in May – July 2021 in the work area of the Yogyakarta City Health Office, in the province of Yogyakarta Special Region. The sampling method used was non-probability sampling, and the sampling was done by using purposive sampling. The inclusion criteria were mothers who gave birth in 2019 and were domiciled in Yogyakarta. The samples obtained were 300 mothers with the proportion of 150 mothers with normal BMI as a control variable and 150 mothers with obese BMI. The research instrument was a brief questionnaire containing the data on maternal weight before the last pregnancy, mother's last education, age, parity, duration of breastfeeding, and the time when the additional food was given to the babies for the first time. Data collection was carried out in May – July 2021 in all Public Health Centers in the Yogyakarta City Health Office area. The researchers carried out data collection by conducting short online interviews. In some areas of the public health center, the researchers were assisted by cadres in collecting samples by distributing online questionnaires. This research used the Chi-Square test and T-test analysis to determine the relationship between pre-pregnancy BMI and maternal characteristic factors with breastfeeding duration, with a significance level of $\alpha = 0.05$ and if $t\text{-count} > t\text{-table}$. A linear regression test was conducted to determine the most influential variable on the duration of breastfeeding. The analysis of this research used the SPSS version 21 program.

RESULTS AND DISCUSSION

Table 1 shows that the research respondents ranged from 17 – 48 years old with the majority of respondents (81.3%) being of reproductive age (20 – 35 years) and the average age is 29.47. The majority of respondents in this research were primiparous (56.3%) and the majority of mothers had higher education (93.7%). Mother's pre-pregnancy BMI ranged from 17.30 – 43.40 with an average value of 25.68 where this number refers to obese BMI. Based on the data containing the duration of breastfeeding that has been collected, the majority of mothers managed to breastfeed exclusively (64.3%) with a duration range of 0-6 months. Respondents breastfed exclusively for 4.65 months on average.

Table 1. The Frequency Distribution of Respondents' Characteristics in Yogyakarta

Characteristics	n	%	Mean	Min	Max
Age					
< 20 yo	9	3			
20 yo – 35 yo	244	81.3	29.47	17	48
>35 yo	47	15.7			
Parity					
Primi	169	56.3			
Multi	126	42	1.74	1	5
Grande	5	1.7			
Education					
Low	19	6.3			
High	281	93.7	-	-	-
Pre-pregnancy BMI					
Normal BMI	150	50	25.68	17.30	43.40
Obese BMI	150	50			

Characteristics	n	%	Mean	Min	Max
Breastfeeding Duration	90	30			
≤ 2 months	17	5.7	4.65	0	6
4 months	193	64.3			
6 months					
Total	300	100			

Source: Data primer, 2021

Table 2. The Effect of Pre-pregnancy BMI on the Duration of Breastfeeding during Exclusive Breastfeeding

BMI	Breastfeeding duration						Total		BMI	t- value	p-value
	≤ 2 months		4 months		6 months		n	%			
	n	%	n	%	n	%					
Normal	32	21.3	4	2.7	114	76	150	100	21.57	112.5	.000
Obese	58	38.7	13	8.7	79	52.7	150	100	29.80	69.4	.000

Source: Data Primer, 2021

Table 2 shows the results of the bivariate analysis of the pre-pregnancy BMI variable. 76% of mothers with normal BMI had the longest breastfeeding duration of 6 months, and 21.3% of mothers with normal BMI did not succeed in exclusive breastfeeding with a breastfeeding duration of ≤ 2 months. The average value of BMI in mothers with normal BMI is 21.57. The result of the statistical test on mothers with normal BMI had a significance value of 0.00 and the analysis of t-value was 112.5 > 1,968 which means that normal BMI corresponds to the duration of breastfeeding during exclusive breastfeeding and has 112.5 chances for exclusive breastfeeding.

Data on mothers with obese BMI showed that 58 (38.7%) mothers had breastfeeding duration of ≤ 2 months, 13 (8.7%) mothers exclusively breastfed for up to 4 months, and 79 (52.7%) obese mothers managed to breastfeed for 6 months. The average value of BMI in obese mothers is 29.80. The results of the chi-square statistical test showed that mothers with obesity showed a p-value of 0.00 and from the analysis of the t-value of 69.3 > 1.968, it showed that obese BMI corresponds to the duration of breastfeeding with 69.3 chances of exclusive breastfeeding.

Table 3. The Effect of Characteristics on the Success of Exclusive Breastfeeding

Characteristics	Breastfeeding Duration						Total		t-value	p-value
	≤ 2 months		4 months		6 months		n	%		
	n	%	n	%	n	%				
Age	90	30	17	5.7	193	64.3	300	100		
<20 year	5	55.6	2	22.2	2	22.2	9	100	89.02	.001
20-45 ear	78	32	15	6.1	151	61.9	244	100		
>35 year	7	14.9	0	0	40	85.1	47	100		
Education	90	30	17	5.7	193	64.3	300	100		
Low	0	0	0	0	19	100	19	100	137.49	.004
High	90	32	17	6	174	61.9	281	100		
Parity	90	30	17	5.7	193	64.3	300	100		
Primi	74	43.8	13	7.7	82	48.5	169	100	47.39	.000
Multi	16	12.7	4	3.2	106	84.1	126	100		
Grande	0	0	0	0	5	100	5	100		

Source: Data Primer, 2021

Table 3 shows the characteristics of the mothers, while the age factor shows that mothers who are in reproductive age (20-35 years) have a success rate of breastfeeding for 6 months, with the percentage of 61.9%, mothers with age > 35 years also show a fairly high percentage of breastfeeding duration up to 6 months that is equal to 85.1%. In mothers aged < 20 years, it was discovered that 55.6% did not give exclusive breastfeeding with a breastfeeding duration of ≤ 2 months. The result of statistical

tests using the chi-square test found a p-value of 0.000; therefore, the significance level was <0.05 and the t-value is $89.02 > 1.968$, which means that research shows a correlation between age characteristics and breastfeeding duration.

In terms of educational characteristics, most of the respondents have a high level of education, from a total of 300 respondents only 19 respondents have a low level of education. Mothers with low education were all successful in exclusive breastfeeding (100%), while mothers with high levels of education had a percentage of 61.9% for breastfeeding with a duration of 6 months. The results of statistical tests using the t-test showed that the t-value was $66,499 > 1,968$ and the chi-square test found a p-value of 0.001. Therefore, it is concluded that there is a correlation between a mother's education and the duration of breastfeeding.

The results of parity factor analysis showed that mothers who had given birth previously had a high success rate of exclusive breastfeeding. Multigravida mothers have a success rate of 84.1% and all grand multigravida mothers are successful in giving exclusive breastfeeding (100%). Mothers who gave birth for the first time (primigravida) showed the highest failure rate in exclusive breastfeeding compared to other groups of mothers, which was 43.8% with a breastfeeding duration of ≤ 2 months. The result of statistical tests using the chi-square test found a p-value of 0.000 <0.05 and the result of the t-test value was $14,784 > 1,968$, which means it can be concluded that there is a correlation between maternal parity and duration of breastfeeding.

Table 4. The result of the Linear multivariate regression test with the Backward method between characteristics and Pre-pregnancy BMI on the Duration of Breastfeeding in Exclusive Breastfeeding

	Sig.	Coef (B)	T	95% C.I for EXP (B)	
				Lower	Upper
Pre-pregnancy BMI	.000	-.222	-4.162	-.594	-.212
Age	.072	.108	1.803	-.022	.497
Education	.022	-.122	-2.298	-.847	-.066
Parity	.000	.285	4.741	.286	.692
Constant	.000		5.485	1.677	3.554

Source: data primer, 2021

Table 4 is the result of the linear regression analysis, two variables have a significance of > 0.05 , which are the educational variable with a value of 0.22 and age with a value of 0.072. This means that both age and education do not have a significant effect on the duration of breastfeeding during exclusive breastfeeding; therefore, both variables are excluded from the characteristic factor.

In the pre-pregnancy BMI variable and the parity variable, both have the same significance level of 0.00, therefore the significance level is <0.05 , it is concluded that the pre-pregnancy and parity BMI variables have a strong significant effect on the duration of breastfeeding during exclusive breastfeeding. Both variables have the same significance level, based on the value of the B coefficient, it can be concluded that parity is a more positive factor affecting the success of exclusive breastfeeding where the B coefficient is 0.285 and the T-value is 4.741, while the B coefficient on pre-pregnancy BMI is -0.222 with a T value of -4.162 which means, the higher the value of a mother's pre-pregnancy BMI, the shorter the duration of breastfeeding during exclusive breastfeeding.

Research data show that mothers with obesity before pregnancy have a lower success rate of exclusive breastfeeding compared to mothers with normal weight. The results of this research are in alignment with infants of obese mothers may have (Donath & Amir, 2008) and (Boudet-Berquier et al., 2018) which show that obese women are inclined not to exclusively breastfeed. The results of the research conducted by (Donath & Amir, 2008) entitled "Maternal Obesity and Initiation and Duration of Breastfeeding: Data from the longitudinal study of Australian Children" state that obese women stop

breastfeeding in the first week of birth compared to women of normal weight and those who manage to breastfeed for 1 week tends to stop before 6 months. (Boudet-Berquier et al., 2018) entitled "Association between maternal pre-pregnancy obesity and breastfeeding duration: Data from a nationwide prospective birth cohort" also has the same results where obese women tend to give mixed formula milk earlier than women with normal BMI. The results of this research state that 83% of obese mothers started giving additional food or a mixture of formula milk to their babies at the age of 3 months. Pre-pregnancy obesity is thought to be the strong cause of the failure of exclusive breastfeeding compared to mothers who experience excessive weight gain during pregnancy. Women who are obese long before pregnancy tend to have a disturbance in insulin balance which results in impaired protein in the body that can affect breast development which leads to obese women's breasts being inclined to have thicker fat tissue and fewer mammary glands (Guyton & Hall, 2007).

In contrast to (Bartok et al., 2012) and (O'Sullivan et al., 2015) research stating that the BMI of obese mothers was not an independent risk factor in the failure of exclusive breastfeeding, the last multivariable factor that influenced the success of exclusive breastfeeding the most was how long the mother planned to breastfeed her baby and the low self-efficacy factor.

Mothers with pre-pregnancy obesity also experience insulin resistance, which is known that in early childbirth, milk production and secretion are regulated by the endocrine and require insulin. The insulin resistance found in obese mothers inhibits milk production which causes delays in the process of lactogenesis II in obese mothers ("Obesity as a Predictor of Delayed Lactogenesis II," 2017). Adipose tissue or thick fat in obese women allows higher levels of progesterone because the storage of progesterone occurs in fat. It is known that high progesterone levels will hold or inhibit breast milk secretion (Marshall et al., 2019). The delay in the process of lactogenesis II and disturbances in the production of breast milk make obese mothers unable to meet the needs of their baby's milk at the beginning of birth.

High levels of fat in obese mothers increase leptin secretion. High levels of leptin increase the performance of estrogen receptor alpha (ER α), thus causing high levels of estrogen in the body of obese mothers; therefore, it interferes with or reduces breast milk production (Chamberlin et al., 2017). Research done by (Oddy et al., 2006), states that infants of obese mothers may have high energy needs. The problem of low milk production and high needs for breastfeeding for infants makes the infants' satisfaction with breastfeeding unfulfilled, allowing obese mothers to stop exclusive breastfeeding even though they have successfully breastfed in the early weeks of birth and there is a possibility that mothers will start making mixed nutrition with formula milk.

Based on the results of this research, the researchers assume that pre-pregnancy obesity influences exclusive breastfeeding. This is likely to happen because mothers with pre-pregnancy obesity have different breast anatomy conditions and hormonal patterns. This will affect milk production. 38.7% of obese mothers stopped breastfeeding after ≤ 2 months, this may be due to a lack of milk production in the early postnatal period that leads to mothers feeling their milk is not coming out and deciding to stop breastfeeding. The results of data analysis show that mothers with obesity have 96 opportunities to exclusively breastfeed, this is probably supported by the maternal characteristics in this research, the majority of whom are of reproductive age and have higher education.

In terms of age characteristics, this research is in alignment with the research conducted by (Conita, 2014) which states that age has an indirect correlation with breastfeeding success after linking the age factor with the level of emotional maturity of the mother in taking care of her baby. In her research, respondents aged < 20 years had the lowest success rate of breastfeeding. Failure in exclusive breastfeeding possibly happens because they are not physically, psychologically, and socially ready, this can disrupt the psychological balance that can affect breast milk production resulting in mothers being unable to care for their baby optimally.

Several other studies state that age does not correlate with breastfeeding. (Ulfah & Nugroho, 2020) which examines the correlation between age, occupation, and mother's education in exclusive breastfeeding states that age does not have a significant correlation with exclusive breastfeeding with a p-value of 0.413. The same thing was also shown in (Fakhidah & Palupi, 2018) which stated that there was no difference in the proportion of breastfeeding for mothers aged 20-30 years, aged <20 years, and aged >35 years.

(Arini, 2012) states that maternal age greatly determines maternal health because it is related to the conditions of pregnancy, childbirth, and postpartum, as well as how to breastfeed the baby. In this research, the success rate of exclusive breastfeeding was mostly found in the reproductive age group. Mothers who are of a healthy reproductive age have more mature physical conditions and can manage emotions; therefore, they are more prepared to face pregnancy, childbirth, and take care of their babies. As mentioned by (Wawan & Dewi, 2011), that the older a person is, the better their level of maturity and strength to think and work will be.

According to (Arini, 2012), older mothers whose age is at risk for giving birth experience a decrease in hormone production, resulting in a decreased lactation process. At this age, giving birth is considered a risk because it is closely related to nutritional anemia which can affect breast milk production. In this research, the success rate of breastfeeding in older mothers is quite high. This is possible because of another factor where the older the mother, the more emotionally mature, the more knowledge and experience she has, and the higher her awareness and responsibility will be; therefore, it affects breastfeeding patterns (Conita, 2014).

Based on the analysis above, the researchers assume that age characteristic factors are indirectly related to the duration of breastfeeding. Data showed that 80.1% of mothers aged > 35 years had a 6-month duration of breastfeeding; therefore, physiological factors in older mothers did not have a significant impact on the duration of breastfeeding. In mothers aged < 20 years, 55% of mothers stopped breastfeeding exclusively when the baby was ≤ 2 months old; therefore, it can be concluded that age correlates with the duration of breastfeeding, due to the maturity and mental readiness of the mother in taking care of her baby.

In this research, education is correlated with the duration of breastfeeding, this is in alignment with (Yuliawati et al., 2018) which states that mother's education has a correlation with breastfeeding failure, where the higher the mother's education level, the knowledge will be better and it will be easier to accept a new idea. (Conita, 2014) also states the same thing, that the higher a person's level of education, the higher their ability to absorb knowledge; however, a high level of education without adequate knowledge of breastfeeding does not guarantee successful breastfeeding.

This is in contrast to (Ulfah & Nugroho, 2020) which stated that there was no correlation between the mother's level of education and the success of breastfeeding. (Fakhidah & Palupi, 2018) also stated similar results that there was no correlation between education and the success of exclusive breastfeeding. According to her research, mothers with low education levels were no less proficient than mothers with higher education in seeking information through electronic media and information from cadres or midwives.

In general, maternal education is something that can support exclusive breastfeeding. Mothers with higher education will have broader knowledge than mothers with lower education. Education can also encourage a mother to seek experiences that she has not previously had which can then increase her knowledge. Improved knowledge is not only obtained through formal education, aside from that, the support from family is also a supporting factor in exclusive breastfeeding (Elinofia & Roma, 2011).

In this research, it was discovered that 100% of mothers with low education levels (elementary and junior high school) had a 6-month breastfeeding duration, while there were still 32% of mothers with high education levels who breastfed with the duration of ≤ 2 months. The researchers assume that

mothers with low education levels do not also mean having less knowledge. Knowledge is not always obtained through formal education; easy access to information can be used to improve mothers' knowledge.

The data of this research indicate that mothers who have given birth before (multipara and grand multigravida) have a higher success rate of breastfeeding compared to mothers who have given birth for the first time (primipara). This is in alignment with the research done by (Ngo et al., 2019), which states that the experience of mothers in breastfeeding is a fast and strong foundation of successful breastfeeding, has higher self-efficacy than those who have not had breastfeeding experience; therefore, the success rate of exclusive breastfeeding is higher compared to mothers who just gave birth for the first time.

In contrast to (Untari, 2017) which stated that parity had nothing to do with the duration of breastfeeding, as there may be socio-cultural differences, mothers' and family's lack of knowledge, and inadequate health services. Similar results were also found in (Fauzi, 2019), which stated that parity was not related to the duration of breastfeeding. The family support factor is thought to be an influence on the mother's decision to breastfeed; therefore, mothers who have had previous breastfeeding experiences do not necessarily have a positive influence on the duration of breastfeeding.

Primiparous mothers have a small number of prolactin receptors which causes reduced prolactin stimulation that can interfere with milk production. Primiparous mothers will experience problems when it comes to caring for their babies because of the lack of experience. Education and experience from others will play an important role in primiparous mothers, if the mother gets poor experience and education, it can cause doubts in the implementation of breastfeeding (International Lactation Consultant Association in (Hasianah et al., 2014).

Based on the results of the analysis above, the researchers assumed that parity is a characteristic factor associated with the duration of breastfeeding, as seen from the data in this research which showed that multiparous mothers (84.1%) and grand multigravida (100%) had a 6-month breastfeeding duration. Previous experience factors have a positive impact on breastfeeding. This is likely because mothers who have previous breastfeeding experience have a higher level of confidence in caring for their babies compared to primigravida mothers who have no experience at all, which can trigger anxiety or doubts when breastfeeding their babies.

Based on the linear regression test, the pre-pregnancy BMI and parity variables were the most influential factors on the duration of breastfeeding, but the parity variable had a greater influence with a B coefficient of 0.285. The results of this research are in alignment with Ervina's research (2018) which states that the parity factor is related to exclusive breastfeeding, which shows that primiparous mothers have a 3-fold risk of not giving exclusive breastfeeding compared to multiparous mothers. The results of the interview concluded that primiparous mothers have no experience, lack knowledge, and have the assumption that breastfeeding can make the breasts saggy. Multiparous mothers already have experience and knowledge from previous parity; therefore, they have a greater chance of giving exclusive breastfeeding (Mabud et al., 2014).

This is in contrast to (Hastuti et al., 2015) and (Untari, 2017) research, which stated that parity did not affect exclusive breastfeeding. According to their research, parity did not affect exclusive breastfeeding, but there may be socio-cultural factors, mothers' and family's lack of knowledge, unsupportive health lines, as well as family support factors. If the mother has had experience with children before, but there were no supporting factors, it would affect the mother's decision to give exclusive breastfeeding.

The obesity variable is also statistically proven to affect exclusive breastfeeding. These results are in alignment with the research done by (Boudet-Berquier et al., 2018), which states that obese women tend to stop breastfeeding before 6 months. Berquier divided obese mothers into two groups,

namely obese primiparous mothers and obese multiparous mothers. In obese primiparous mothers, the failure of exclusive breastfeeding occurs due to the low prolactin response and the delay in the lactogenesis process, while the failure of exclusive breastfeeding in the group of obese multiparous mothers depends on the method of delivery and weight gain during pregnancy.

Based on the analysis above, the writer assumes that the pre-pregnancy BMI and parity are two interrelated variables. Primiparous mothers have a small number of prolactin receptors and lack of experience coupled with obesity conditions that allow for disturbances in breastfeeding, such as hormone disorders, imperfect breast growth, and delays in the process of lactogenesis II, thereby increasing the failure of exclusive breastfeeding in primiparous mothers with obesity (Donath & Amir, 2008); (Guyton & Hall, 2007); (Hasianah et al., 2014); (Ngo et al., 2019).

Multiparous mothers with obesity have a lower risk of exclusive breastfeeding failure due to the factor of a greater number of prolactin receptors and having had breastfeeding experience in previous childbirths (Ngo et al., 2019). According to (Hastuti et al., 2015), multiparous mothers who have previously breastfed for > 3 months will breastfeed their next children for a longer duration.

CONCLUSION

In conclusion, pre-pregnancy BMI and parity are the most influential factors on the duration of breastfeeding for mothers during exclusive breastfeeding, where the higher the BMI value, the lower the probability of exclusive breastfeeding is, and the higher the parity of the mother, the higher the probability of exclusive breastfeeding is. These two variables are interrelated, primiparous mothers who are obese have a risk of failure to exclusively breastfeed compared to multiparous mothers who are obese, due to the factors of breastfeeding experience and disruption of lactation processes..

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