

# The Relationship Between Breastfeeding Pattern and the Risk of Postpartum Depression of Mothers in Tangerang

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## Abstract

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**Background and Aim:** Postpartum depression (PPD) has a negative impact on mothers and children, such as breastfeeding (BF) disturbance. However, the relationship between BF pattern and PPD is still unclear due to contrasting results, and no related study has been done in Indonesia. Therefore this study is conducted to evaluate the relationship between BF pattern and the risk of PPD of mothers in Tangerang.

**Method:** This is an analytic observational study with a cross-sectional design. The samples of this study are 58 mothers that fulfill the inclusion criteria. Samples are chosen by purposive sampling method. Data collection is conducted from January to April 2020. The results were analyzed using SPSS program version 22.0 with Chi-Square method.

**Results:** There were 37 samples (63.8%) without PPD risk and 21 samples (36.8%) with PPD risk. Among 37 samples without PPD risk, 70.3% had exclusive BF and 29.7% had non-exclusive BF. Among 21 samples with PPD risk, 14.3% had exclusive BF and 85.7% had non-exclusive BF. Chi-Square analysis result showed that there is a significant association between BF pattern and PPD risk ( $p=0.0001$ ), with an OR of 0.071 (95% CI: 0.17-0.289).

**Conclusion:** Breastfeeding pattern has a significant association with PPD risk. Exclusive BF has a protective effect on the risk of PPD at one month postpartum.

## Introduction

Postpartum depression (PPD) is a common medical complication of pregnancy and childbirth. The definition of PPD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is a mood disorder that can occur during pregnancy and within four weeks postpartum.<sup>1</sup> Symptoms of PPD include feelings of loneliness, sleep disturbances, decreased appetite, and emotional changes.<sup>2</sup> The incidence rate of PPD in Indonesia is still unclear, because no institution had conducted the research, and there are still many mothers with PPD who are not diagnosed properly. The study conducted at Dr. Soetomo Hospital in Surabaya in 2006 had found that the incidence of PPD was 22.35%.<sup>3</sup> A research at Haji Adam Malik General Hospital Medan in 2009 had found that the incidence of PPD was 16%.<sup>4</sup>

Postpartum depression can last for years. Approximately 25-50% of mothers experience PPD that lasts more than seven months.<sup>5</sup> Long-term PPD harms maternal mental health and causes social problems, even leading to problems after recovery.<sup>5-8</sup> Postpartum depression is also associated with an increased risk of chronic medical disorders and behaviours, such as smoking and alcohol abuse.<sup>9-11</sup> Postpartum depression also negatively impacts children's cognitive, social and physical development. Mothers who suffer from PPD will also encounter economic burden, because they require large costs for health care, and can cause losses in productivity due to absence from work, early retirement, or long-term unemployment.<sup>12,13</sup>

Postpartum depression can also cause interference in breastfeeding. Initially, the relationship between

breastfeeding and PPD was described as unidirectional, with PPD leading to lower rates of breastfeeding initiation and early cessation of breastfeeding.<sup>14</sup> Recently, several studies had found that the relationship may be bidirectional. Reports showed that PPD can reduce breastfeeding rates, and conversely, no initiation of breastfeeding can increase PPD risk. Several studies had shown an association between a longer duration of breastfeeding and a lower prevalence of PPD.<sup>15–17</sup> Other studies had reported that breastfeeding is a protective factor against PPD and assists faster recovery from PPD symptoms.<sup>18</sup> There were also several studies about the relationship between breastfeeding and PPD that had different conclusions. Some researchers had reported that there is no relationship between breastfeeding and PPD. Meanwhile, two studies had found that breastfeeding mothers have a higher risk of developing depression.<sup>19–21</sup>

The effect of breastfeeding on the risk of PPD is still not well understood, due to contrasting conclusions from various studies. Several studies showing the positive effect of breastfeeding have small samples and only a few have controlled for confounding factors such as socioeconomic factors, relationship quality, and stressful life events.<sup>22,23</sup> Most of the studies conducted did not control for maternal mental health conditions previously.<sup>24</sup> Compared to the number of studies on the relationship between PPD and initiation of breastfeeding, only few had analysed the relationship between breastfeeding patterns and the risk of PPD, especially in Indonesia. For this reason, this study was done to know whether the pattern of breastfeeding can affect the risk of PPD in mothers in Tangerang, Indonesia.

## Methods

This is an analytic observational study with a cross-sectional study design. A purposive sampling method was conducted in 5 public health centre's (Pusat Kesehatan Masyarakat) in

Tangerang from January until April 2020. The samples included in this study were mothers in Tangerang who were in 4 weeks postpartum period. The exclusion criteria were mothers with a previous history of PPD or any mental disorders, mothers who obtained a score of  $\geq 10$  in Edinburgh Postnatal Depression Scale (EPDS) during the third trimester of pregnancy, mothers who gave birth to a premature, congenitally ill, or dead baby, or baby treated in NICU (Neonatal Intensive Care Unit). Initially, mothers who were in the third trimester of pregnancy were recruited and the risk of PPD was assessed using the EPDS questionnaire. Mothers who were in the third-trimester pregnancy that scored  $\geq 10$  in EPDS (having the risk of PPD), have ever been diagnosed or treated for mental disorders were excluded from this study. After 4 weeks postpartum, the included samples were assessed using the EPDS questionnaire again.

The primary data used in this study were obtained through questionnaires, which included the EPDS. The EPDS consists of ten questions that assess the patient's mood over the past week. In each question, respondents were asked to choose from a series of possible responses. Each response was given a score of 0-3. A total score of 10, or any positive response to "thoughts of hurting myself had crossed my mind", means that the mother is more likely to have PPD. Demographic data collected include age, marital status, occupation, income, and education. Data were analysed using SPSS program version 22.0 with Chi-Square method.

## Results

A Total Of 58 Mothers Who Fulfilled The Inclusion And Exclusion Criteria Were Included In This Study. The Respondents' Age Were Between 22-38 Years, With An Average Of 28.05 Years. All Respondents Were Married, And 56 (96.55%) Were Housewives. There Were 5.17% With Middle-Income, 82.76% With High-Income, And 12.07% With Very High-Income

(According To The Classification Of Central Statistics Agency (Badan Pusat Statistik)). Respondents' Education Consisted Of Primary Education (17.24%), Secondary Education (72.41%), Higher Education (10.35%). There Were 29 Respondents (50%) Who Gave Exclusive BF (Up To One Month), 22 Respondents (37.93%) Who Fed Breast Milk And Formula Milk, And Seven Respondents (12.07%) Who Did Not BF At All (Only Fed Formula Milk). The Following Table Contains The Demographic Data Of The Respondents.

**Tabel 1.** Demographic Data of Study Respondents

	n	Percentage (%)
Age (years)		
20-25	9	15,52
26-30	39	67,24
>30	10	17,24
Status		
Married	58	100
Occupation		
Working	2	3,45
Unemployed	56	96,55
Income		
< Rp. 1.500.000 /month (Low)	-	-
Rp. 1.500.000-2.500.000 /month (Middle)	3	5,17
Rp. 2.500.000-3.500.000 /month (High)	48	82,76
> Rp. 3.500.000 /month (Very High)	7	12,07
Education		
Primary Education	10	17,24
Secondary Education	42	72,41
Higher Education	6	10,35
Breastfeeding Pattern (1 month)		
Exclusive Breastfeeding	29	50
Non-exclusive Breastfeeding (with formula milk)	22	37,93
Did not Breastfeed	7	12,07

From the data obtained, it was found that 37respondents (63.8%) had no risk for PPD, and 21 respondents (36.8%) had a risk for PPD at 4 weeks postpartum. Among 37 respondents who were not at risk, there were 70.3% who gave exclusive breastfeeding, 27% who gave breast milk with complementary feeding (formula milk), and 2.7% who did not breastfeed at all. Among 21 respondents who were at risk, 14.3% gave exclusive breastfeeding, 57.1% gave breast milk with complementary feeding (formula milk), and 28.6% did not breastfeed at all. Data

regarding breastfeeding patterns and PPD risk is shown in Table 2 below.

**Table 2.** Comparison of Breastfeeding Patterns with Risk of Postpartum Depression among Respondents (3 x 2 Table)

Breastfeeding Pattern	PPD Risk (EPDS)				Total
	No Risk for PPD(Total Score <10)		Risk for PPD (Total Score ≥10)		
	n	%	n	%	
<b>Exclusive BF</b>	26	70,3	3	14,3	29
<b>Non-exclusive BF (with complementary feeding)</b>	10	27	12	57,1	22
<b>Did not BF</b>	1	2,7	6	28,6	7
<b>Total</b>	37		21		58

To analyse the relationship between breastfeeding patterns and the risk of PPD, a 3 x 2 table was created and the analysis was carried out using the Chi-square test. Based on these results, it was found that there were more than 20% of the number of cells that had an expected value (E value) of less than five, so this 3 x 2 table did not meet the Chi-Square criteria. Therefore, the category of 'non-exclusive breastfeeding' was merged with 'did not breastfeed' to increase the expected frequency. The following table is a 2 x 2 table of the results combining the two categories (Table 3).

**Table 3.** Analysis of Breastfeeding Patterns with the Risk of Postpartum Depression (2x2 Table)

Breastfeeding Pattern	PPD Risk (EPDS)				P-value	OR (95% CI)
	No Risk for PPD(Total Score <10)		Risk for PPD (Total Score ≥10)			
	n	%	n	%		
<b>Exclusive BF</b>	26	70,3	3	14,3	0.0001	0.071 (0.17-0.289)
<b>Non-exclusive BF</b>	11	29,7	18	85,7		

The results of the Chi-Square analysis showed that there was a significant relationship between breastfeeding patterns and the risk of PPD at 4 weeks postpartum ( $p=0.0001$ ). Based on the results of the odds ratio (OR) analysis, it was found that the value of OR was 0.071 (95% CI: 0.17- 0.289). These results indicated that respondents with exclusive breastfeeding pattern had an odds of 0.071 times to be at risk of PPD at 4 weeks postpartum. The practice of exclusive breastfeeding is protective against the risk of PPD.

## Discussion

From the results of this study, we found that the practice of exclusive breastfeeding of mothers in Tangerang is still lacking. Many mothers did not understand the importance of exclusive breastfeeding, therefore they did not practice it correctly. Some mothers had never heard of PPD and they did not know that they might carry the risk of having PPD. This is due to the lack of knowledge and education regarding mental health in the society.

Several studies had analysed the relationship between PPD and initiation of breastfeeding. The studies showed that mothers who experienced PPD would have a shorter duration of breastfeeding, and the condition of PPD in mothers could be a predictor for breastfeeding initiation and the risk of breastfeeding cessation before six months.<sup>14,25,26,27,28</sup>

Studies by Mezzacappa et al and Figueiredo et al reported that mothers who breastfed had a reduced risk of PPD up to three months postpartum.<sup>18,29</sup> A cohort study by Ystrom et al showed that mothers who exclusively breastfed had a lower risk of PPD and early cessation of breastfeeding can increase maternal anxiety and depression.<sup>28</sup> Field et al stated that breastfeeding has an antidepressant effect.<sup>30</sup> This can be an explanation that exclusive breastfeeding is protective against the risk of PPD in this study (OR = 0.071, 95% CI: 0.17-0.289).

Several researchers had found that breastfeeding can have a protective effect on maternal psychological health because breastfeeding can reduce stress responses.<sup>16,17,31</sup> A study by Mezzacappa and Katkin showed that the lactogenic hormones, namely oxytocin and prolactin, have anxiolytic (anxiety lowering) and antidepressant effects.<sup>16</sup> Based on studies by Groer and Davis<sup>32</sup>, Heinrichs et al<sup>31</sup>, Nierop et al<sup>33</sup>, and Tu et al<sup>34</sup>, lactation could cause a decreased stress response, especially to cortisol. It was found that there was a decrease in the stress response of total cortisol and free cortisol in mothers who breastfed compared to mothers who did not breastfeed. These results indicated that lactation decreases neuroendocrine responses to stress and is associated with decreased PPD symptoms.

According to Taylor et al, the diurnal cortisol pattern also has an effect on decreasing PPD symptoms. Based on the study by Taylor et al, mothers who were depressed had high cortisol levels when they woke up but did not experience an increase from waking up to 30 minutes. In non-depressed mothers, a significant increase in cortisol levels was found from waking up to 30 minutes.<sup>35</sup> The results supported that PPD is affected by dysregulation of the HPA axis. As previously described, lactation and breastfeeding can help regulate neuroendocrine responses and diurnal cortisol secretion patterns, therefore the stability of diurnal cortisol secretion can reduce PPD symptoms.

Another factor related to breastfeeding is the regulation of sleep cycles of both mother and baby. Breastfeeding can help mothers reduce fatigue and symptoms of depression. According to Doan et al, mothers who breastfeed exclusively had longer sleep duration (a mean of 45 minutes longer) and fewer sleep disturbances than mothers who breastfeed non-exclusively.<sup>36</sup> Based on studies by Posmontier et al and Goyal et al, mothers with PPD had poorer sleep quality than mothers without PPD.<sup>37,38</sup> From the results of these studies, it can be

concluded that breastfeeding improves sleep quality in mothers, thereby reducing the risk of PPD.

Based on the results in this study, there was a significant relationship between breastfeeding patterns and the risk of PPD ( $p=0.0001$ ) at one month postpartum. Breastfeeding was protective against PPD (OR=0.071, 95% CI: 0.17-0.289). These results are in accordance with the results of other studies (Figueredo et al. 2014<sup>18</sup>; Hamdan et al. 2012<sup>39</sup>; Dunn et al. 2006<sup>40</sup>). A cohort study by Figueredo et al on 181 pregnant women in Portugal found that mothers who exclusively breastfed for up to three months had a lower EPDS score ( $p < 0.001$ ).<sup>18</sup> A cohort study by Hamdan et al on 137 postpartum mothers in Saudi Arabia reported that mothers who breastfed exclusively for up to two and four months had a lower EPDS score ( $p < 0.0037$ ;  $p < 0.0001$ ) and had a lower risk of developing PPD at four months postpartum ( $p < 0.0025$ ).<sup>39</sup> According to a cohort study by Dunn et al on 524 postpartum mothers in Canada, exclusive breastfeeding for up to six weeks postpartum was the most protective against the risk of PPD.<sup>40</sup>

## Conclusion

Based on the results of this study, it was found that the practice of exclusive breastfeeding in Tangerang is still lacking and many mothers were unaware that they might carry the risk of PPD. This study was

conducted to evaluate the relationship between breastfeeding patterns and postpartum depression in mothers in Tangerang. The analysis results indicated that there is a significant relationship between breastfeeding patterns and the risk of PPD at 4 weeks postpartum. Respondents with exclusive breastfeeding patterns had a lower risk of PPD than respondents with non-exclusive breastfeeding patterns. The results of the analysis showed that exclusive breastfeeding was protective for the mother against the risk for PPD at 4 weeks postpartum.

Based on the shortcomings of this study, the researchers suggest that future studies can analyse the factors that are influenced by breastfeeding, such as neuroendocrine or hormonal factors, sleep cycle regulation, and sleep quality, since these factors can be related to the presence of symptoms and the PPD risk. Future studies are expected to control for confounding variables, such as socioeconomic factors, relationship quality, and social environment. Researchers also suggest that future research can be carried out in a longer period, namely for six months, in order to evaluate the effect of exclusive breastfeeding appropriately.

## Acknowledgments and affiliations

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