Jurnal Info Kesehatan
Vol. 21, No. 1, March 2023, pp. 138-147
P-ISSN 0216-504X, E-ISSN 2620-536X
DOI: *10.31965/infokes.Vol21Iss1.629*
Journal homepage:*http://jurnal.poltekeskupang.ac.id/index.php/infokes*

RESEARCH **Open Access**

Effect of Sociodemographic Factors on the Risk of Postpartum Depression during the Covid-19: Evidence from Tarakan

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Received: 17 December 2021 Revised: 29 March 2023 Accepted: 30 March 2023

Abstract

Social and environmental factors can have an impact on a mother's mental health, especially during a pandemic. Financial stress and the social environment can exacerbate postpartum depression. Postpartum depression is one of the mental health consequences. Postpartum depression is similar to other types of depression, but it occurs as a result of physical and social changes caused by the process of giving birth and raising a child. The objective of this study was to identify the sociodemographic factors that influence the risk of postpartum depression in Tarakan during the Covid-19 pandemic. It was a cross-sectional study conducted in Tarakan's North Tarakan District from August to October 2021. The study included 150 postpartum mothers. In this study, simple random sampling was used. The dependent variable of this study was postpartum depression and independent variables were age, education, income, parity, occupation, and support. Data collection employed questionnaires and logistic regression data analysis with the Stata 13 program. The risk of postpartum depression increased with multiparity (95%CI: 0.11-1.78); p = 0.026), and less income (< minimum wage) (95%CI: 0.01-1.48); p=0.045). The risk of postpartum depression decreased with age (<35 years old) (95%CI: (-2.00) - (-0.25)); p= 0.011), occupation (95%CI: (-1.60) – (-0.07)); p= 0.032), support (95%CI: (-1.76) – (-0.10)); p= 0.028), higher education (95%CI: (-1.22) – 0.24); p= 0.190). Postpartum depression risk increases with multiparity and lower income. With normal age, occupation, support, and education, the risk of postpartum depression decreased.

Keywords: Postpartum, Depression, Sociodemographic.

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1. INTRODUCTION

Tarakan is a coastal town where almost all of the residential areas are located. The people are descended from immigrants, with the majority earning a living as fishermen. With the availability of seaweed commodities, the economic conditions of coastal communities are improving rapidly. The promising results have made families flock to work as seaweed fishermen. Both are used as binders for seaweed seeds (*ma'betang*), as well as for sun drying and transporting seaweed products. Housewives are also involved in the seaweed production process in this case, despite the fact that a mother plays an important role in her family's and her own health (Moelyaningrum, et al., 2022).

Indonesia has been infected with the Covid-19 virus since 2020. A pandemic can have an impact on societal psychological/mental, economic, and social conditions (Maulida et al., 2020). Tarakan still had an increase in cases of positive Covid-19 patients at the beginning of 2021, with an additional 147 people. There was a total of 2,466 new positive cases. Pandemic conditions, on the other hand, have not reduced the birth rate. As a result of the pandemic, it is expected that a greater number of postpartum women will be psychologically affected. Puerperium, as we all know, is the period during which a woman recovers from giving birth. In Tarakan, research on sociodemographic factors associated with depression in postpartum women is still very limited. As a result, the authors want to look into the relationship between socio-demographic factors and the prevalence of postpartum depression in Tarakan. The objective of this study was to investigate sociodemographic factors that correlates the risk of postpartum depression during the Covid-19 pandemic in Tarakan.

Postpartum depression is a condition that develops shortly after a woman gives birth and is characterized by feelings of sadness, loss of interest in daily activities, sleep and eating disorders, feeling useless, tired, or fear of injuring herself or her baby (Nugroho, 2017). Postpartum depression is similar to other types of depression, but it is caused by a reaction to physical and social changes caused by childbirth and parenting. Postpartum depression is more common in mothers who have had complications during childbirth, unwanted pregnancies, or have a low family income (Putriarsih, Budihastuti, & Murti, 2017). In another study, the risk of postpartum depression increased with the type of delivery, delivery complications, and age $\geq$ 35 years old. Meanwhile, traditional postpartum care, higher education, adequate family income, multiparity, intended pregnancy, and marital satisfaction all reduced the risk of postpartum depression (Febrianti, Tamtomo, & Budihastuti, 2020). Researchers believe that hormonal changes associated with pregnancy may make depression more prone to recurrence (Gelaye, et al., 2016).

Postpartum depression affects the first year of growth. Children born to mothers suffering from postpartum depression are more likely to be underweight (Farías-Antúnez, Xavier, & Santos, 2018). Depression treatment can improve newborn growth and development and reduce the likelihood of diarrhea and malnutrition in children. Depression affects 19.8% of women in developing countries during their puerperium (WHO, 2017). Since 2020, the world has been hit by a covid pandemic, one of which has an impact on pregnant women, maternity, and postpartum. Anxiety and depression are the most common psychological issues (Purwaningsih, 2020). During the pandemic, postpartum care can still be provided by health workers with home visits, but with preventive measures from officers, mothers, and families. Postpartum visits can also be carried out by monitoring through online media, unless the mother exhibits danger signs, in which case she should immediately consult with health workers (Kementerian Kesehatan Republik Indonesia, 2020).

The pandemic conditions had no effect on the region's birth rate. It suggests that the number of postpartum mothers who will be affected by the pandemic may increase. As a result,

it is critical to assess the psychological impact of the pandemic on postpartum mothers, as well as the factors that influence it.

2. RESEARCH METHOD

This research is analytical research using a cross-sectional approach, from August to October 2021. The population used in this study were postpartum mothers located in the North Tarakan sub-district. The formula 15-20 research subjects for each independent variable are used to calculate the number of samples used in multivariate analysis (Murti, 2013). This study requires a minimum sample of 10 x (15-20) research subjects, which translates to 150 - 200 research subjects. Considering the time and cost of the study, the researchers decided on a sample size of 150 postpartum mothers. This study's sample criteria were postpartum mothers aged 2 to 6 weeks, who were not seriously ill and were willing to participate. The sociodemographic factor questionnaire was used to collect information. A list of names (initials), age, parity, education, income, occupation, family support, and the EPDS are included in this questionnaire (Edinburg Postpartum Depression Scale).

Age, parity, education, occupational status, and support family were the independent variables. Postpartum depression was the dependent variable, with two categories: at risk of depression and not at risk of depression. If the variable has a score of less than or equal to 8, it is not at risk of depression; if the variable has a score of more than 9 or 14, it is at risk of depression; the maximum value of the EPDS questionnaire is 30. Data was collected directly from respondents by completing online or offline (physical) questionnaires.

Frequency distribution was analyzed by univariate, bivariate to investigate the direct relationship between variables using Chi-Square test, and multivariate analysis by employing logistic regression analysis model with STATA 13 program. The ethical approval in this study was obtained from the Health Research Ethics Committee, Faculty of Health Sciences, University of Borneo Tarakan, Indonesia, No. 011/KEPK-FIKES UBT/VIII/2021.

3. RESULTS AND DISCUSSION

The categorical data sample description elaborates the continuous data on each research variable, such as age, parity, and postpartum depression. Table 1 displays the results of the continuous data analysis.

Table 1. Description of research variables with continuous data.

Variable	**Continuous Data**				
	n	***Mean***	***SD***	***Min***	***Max***
Age	150	29.03	6.671	17	50
Parity	150	2.45	1.272	1	8
Postpartum Depression (>9)	150	7.08	3.586	2	19

Table 2. Description of research variables with dichotomous data.

Variable	**Dichotomous Data**	
	n	**Percentage**
Age		
High Risk (≥35)	42	28.00
Normal (<35)	108	72.00
Parity		
Primipara	50	33.33
Multipara	100	66.67
Education Level		
Low (<High School)	67	44.6

High (≥High School)	83	55.3
Income		
Normal (≥ Rp 3.761.896)	81	54.00
Low (<Rp 3.761.896)	69	46.00
Occupational Status		
Unemployed	89	59.33
Employed	61	40.67
Support		
No Support	100	66.6
Supported	50	33.3

Table 2 illustrates the majority of postpartum mothers aged > 35 years (high-risk) as much as 72%. More than 30% of mothers were with primiparous status. Postpartum mothers with higher education (> SMA) were 55.3%. Postpartum mothers with lower family income earn 54% more than those with incomes above the UMK. There are more postpartum mothers who don't 59.3%. Only 33.3% of mothers received support from their husbands or family during the postpartum period.

Table 3. Chi-square test of the influence of sociodemographic factors on the risk of postpartum depression.

Variable	**Not Depressed**		**Depressed**		**OR CI 95%**	**p**
	n = 93	**%**	**n = 57**	**%**		
Age						
High Risk	63	58.3	45	41.6	0.56	0.138
Normal	30	71.4	12	28.5		
Parity						
Primipara (Children < 2)	37	74.0	13	26.0	2.23	0.032
Multipara (Children ≥ 2)	56	56.0	44	44.0		
Income						
Normal (>= Rp 3.761.896)	56	69.1	25	30.8	1.93	0.051
Low (< Rp 3.761.896)	37	53.6	32	46.3		
Occupation						
Unemployed	48	53.9	41	46.0	0.41	0.014
Employed	45	73.7	16	26.2		
Support						
Supported	55	55.00	45	45.0	0.38	0.012
Not Supported	38	76.00	12	24.0		
Education Level						
Low (< High school)	38	56.7	29	43.2	0.66	0.231
High (> High school)	55	66.2	28	33.7		

Table 3 demonstrates that maternal age had no effect on postpartum depression and was not statistically significant. Postpartum mothers over the age of 35 had a 0.56 times lower risk of developing postpartum depression than mothers under the age of 35 (OR CI 95% 0.56; p = 0.138). Parity had an effect on postpartum depression. Multiparous postpartum mothers were 2.2 times more likely than primiparous mothers to experience postpartum depression (OR CI95% 2.23; p = 0.032). Income had an effect on postpartum depression. Mothers with lower family income (3.761.896) are nearly twice as likely to experience depression as mothers with

higher income (>=3.761.896) (OR CI95% 1.93; p=0.051). There was an effect of work on postpartum depression. However, depending on the number of family members, a sufficient income may not be sufficient to meet family needs.

Postpartum mothers who worked were 0.4 times less likely than mothers who did not work to experience postpartum depression (OR CI95% 0.41; p = 0.014). Postpartum depression was affected by husband or family support. Postpartum mothers who were not supported were 0.4 times more likely than mothers who were supported by their husbands or families to experience postpartum depression (OR CI95% 0.38; p=0.012). The education of the mother had an effect on postpartum depression, but it was not statistically significant. Mothers with a low education are 0.6 times more likely than those with a higher education to experience postpartum depression (OR CI95% 0.66; p = 0.231).

Table 4. Results of logistic regression analysis of sociodemographic factors' influence on the risk of postpartum depression.

Independent Variable	b	CI 95%		p-value
		Lower	Upper	
Fixed Effect				
Age (Normal)	-1.12	-2.00	-0.25	0.011
Parity (Multipara)	0.95	0.11	1.78	0.026
Income (< Minimum wage)	0.74	0.01	1.48	0.045
Occupation (Unemployed)	-0.83	-1.60	-0.07	0.032
Support (Supported)	-0.93	-1.76	-0.10	0.028
Education (High)	-0.49	-1.22	0.24	0.190

Table 4 displaus postpartum mothers of normal age who had log odds for postpartum depression 1.12 units lower than mothers who have a high risk age (b=-1.12; CI (95%)=-2.00 to -0.25; p=0.011). Multiparous postpartum women possessed logodds for postpartum depression 0.95 units higher than primiparous women (b=0.95; (95% CI)= 0.11 to 1.78; p = 0.026). Postpartum mothers with less income (< minimum wage) owned log odds for postpartum depression 0.74 units higher than mothers with sufficient income (>= Minimum wage) (b=0.74; (95% CI)= 0.01 to 1.48; p = 0.045. Working mothers had log odds for postpartum depression 0.83 units lower than mothers who did not work (b=-0.83; (95%CI)= -1.60 to -0.07; p = 0.032). Postpartum mothers who received support had log odds of postpartum depression 0.93 units lower than mothers who did not (b=-0.93; (95% CI)= -1.76 to -0.10; p = 0.028). There was no effect of postpartum mothers' education (> high school) on postpartum depression, but it was not statistically significant (b=-0.49; (95% CI)= -1.22 to 0.24; p = 0.190).

The effect of age on postpartum depression. The results revealed a statistically significant negative effect of age on postpartum depression. Postpartum mothers who were of normal pregnancy age had a lower risk of postpartum depression than women who were of high-risk pregnancy age (under 20 and over 35 years old). The findings of this study are consistent with previous research indicating that maternal age is a factor that influences postpartum depression internally; this is related to maternal age when married and pregnant of 20 years or more than 35 years (Lubis, 2016). According to other studies, pregnant teenagers are more likely to experience postpartum depression. This has an effect on them, their children, and their families (Rahmadhani, Kusumastuti, & Chamroen, 2022). Other studies suggest that postpartum depression is more common in women between the ages of 18 and 23. It is possible as young women who give birth for the first time are more exposed to emotional pressure and the additional burden of caring for the baby (Toru, Chemir, & Anand, 2018). Giving birth at a risky age is generally very susceptible to being a factor causing postpartum depression, but apart from this age factor, it is necessary to consider other factors affecting the incidence of postpartum depression, intended pregnancy, complications during delivery, and type of

delivery. Other researchers contend that there is a relationship between age and the prevalence of postpartum depression (Kim et al., 2019).

The effect of parity on postpartum depression. The results of this study indicate that there is a positive effect of parity on postpartum depression and it is statistically significant. Multiparous women are more likely than primiparous women to experience postpartum depression. Postpartum depression affects a large number of multiparous mothers. This is due to the fact that multiparous mothers already have additional responsibilities such as housework and responsibilities from their existing children. According to research, multiparous mothers do not only concern on caring for their babies, but they also have to care for or care for other children. Thus, a relationship that is not well established between mother and baby in the early stages of birth can create psychological conditions. It is definitely not good for the mother (Rahmadhani, Kusumastuti, & Chamroen, 2022).

Women who have had more than twice the number of births possess a higher risk of postpartum depression compared to women who own just had one child (Pham et al., 2017). Research in India illustrates that the chances of developing postpartum depression are three times higher in women with two or more children (Agarwala, Rao, & Narayanan, 2018). The results of this study are contrary to the results of the study of Solama, Rivanica, Effendi, & Safitri, (2023) which revealed that primiparous mothers possess no experience taking care of children so they have to adapt more than multiparas.

Income has an effect on postpartum depression. According to the findings of this study, family income has a statistically significant positive effect on postpartum depression. Postpartum mothers with low family income are more likely to experience postpartum depression than postpartum women with adequate income (Tarakan monthly minimum wage is at IDR 3,761,896). Education, wealth, and employment status can all influence a person's ability to experience depressive symptoms (Dewi, Relaksana, & Siregar, 2021). This is consistent with previous research, which concluded that economic status and individual happiness point to a potential mechanism that influences a person's income on mental health (Li, Zhou, & Hu, 2022).

One of the factors that can influence postpartum depression is postpartum mothers' fear of family financial problems (Nugroho, 2017). Mothers with higher family incomes are better able to meet their daily needs than mothers with lower incomes. Later on, this will have an effect on the mother's psychology, potentially increasing her risk of depression (Ria, Budihastuti, & Sudiyanto, 2018). On the contrary, the results of other studies explain that economic status which is elaborated by low income contributes to the incidence of postpartum depression (Yasa & Lesmana, 2019). it is in accordance with the results of the author's research.

The effect of Occupation on postpartum depression. The results uncovered that there was a negative effect of working mothers on postpartum depression and it was statistically significant. Working mothers had a higher risk of postpartum depression than nonworking mothers. Postpartum depression is more common in women who work more than 40 hours per week than in women who work less than 40 hours per week (Hahn-holbrook, Cornwell-Hinrichs, & Anaya, , 2018). Postpartum depression does not affect housewives. It could happen because working mothers receive maternity leave, lowering the social status of working mothers to that of housewives during the postpartum period (Vaezi et al., 2018). However, on the other side, it is elaborated that working mothers are more prone to experiencing postpartum depression as they have to adjust to their jobs and take care of their children (Yasa & Lesmana, 2019).

The effect of support family on postpartum depression. The results unveiled that there was a negative effect of support on postpartum depression and it was statistically significant. Mothers who receive support from their husbands and families are less likely to suffer from

postpartum depression than mothers who do not. According to previous research, a lack of social support can increase the risk of postpartum depression (Ardiani, Soemanto, & Murti, 2020). Mothers who do not receive social support are more likely to feel worthless and uncared for by their husbands and families, making them more prone to depression (Rahmadhani, Kusumastuti, & Chamroen, 2022). Research by Anggarini, (2019) states that social support is essential for mothers' physical and psychological health when they take on a new role as parents. Other perspectives argue that a lack of social support can lead to feelings of loneliness, which can exacerbate challenges in raising children and cause mothers to experience postpartum depression (Dlamini, et al., 2019). Research facts reveal, having poor social support is one of the highest contributors to poor mental health (Wubetu, Engidaw, & Gizachew, 2020).

The results of this study are in contrast to the results of Ariyanti, (2020), There is no effect of family support on the occurrence of postpartum depression. This is due to the respondents' characteristics in this study, which include age, parity, education, employment, and economic factors. However, it was also stated that postpartum mothers should be screened in order to avoid postpartum depression. This could be due to the mother's weak condition, as she still requires a lot of assistance; therefore, postpartum mothers must be supported. Social support can help to reduce stress during pregnancy and delivery. As a result, it will have an effect on the postpartum mother's mental health (Vaezi et al., 2018).

The effect of education on postpartum depression**.** The results of the study revealed that education had no effect on postpartum depression and was not statistically significant. Educated mothers usually have everything planned out, from getting pregnant to preparing for their baby's birth (Kurniasari & Astuti, 2015). Postpartum mothers who have a high level of education can reduce the risk of postpartum depression by 2.46 units compared to postpartum mothers who possess low education (Jannah, Budihastuti, & Murti, 2019). Another study discovered that mothers with only an elementary education had a higher risk of postpartum depression (Demirel et al., 2018). The results of this research differ from those of previous studies, which discovered that education level has no effect on the incidence of postpartum depression. The current situation enables every mother to seek information about health, particularly through social media. It was revealed by Faisal (2020) who elaborated that there was a relationship between exposure to information media and the level of knowledge of mothers about the danger signs of the puerperium.

Mothers' exposure to health workers or cadres also allows them to obtain health information during childbirth. Regardless of educational background, exposure to information can influence maternal health knowledge and behavior during the puerperium (Kusuma, 2023). It greatly assists mothers and families in providing support in order to reduce the risk of postpartum depression. On the other hand, even postpartum mothers with a high level of education are at risk for depression. Postpartum mothers with a higher education may still be at risk of depression because they often feel conflicted about their roles as mothers in caring for their children and families and their desire to advance in their careers (Kurniasari & Astuti, 2015).

4. CONCLUSION

According to the findings of this study, age, parity, income, occupation, and support are sociodemographic factors that influence the risk of postpartum depression during the Covid-19 pandemic in Tarakan. During the Covid-19 pandemic, this research may provide additional information about postpartum depression and be useful to health workers in providing comprehensive care to postpartum mothers.

ACKNOWLEDGMENTS

The researchers would like to thank the University of Borneo Tarakan through the Institute of Research and Community Service (LPPM) which has funded this research activity sourced from the DIPA of the University of Borneo Tarakan, and Juata Permai Health Center for providing support and information in the process of implementing this research activity.

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