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Postpartum Depression in Primigravida: The Influence of Maternal Factors in Indonesia

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Abstract
Background: Postpartum depression (PPD) is a common non-psychotic mental disorder that occurs after childbirth and negatively impacts maternal quality of life, child development, and family stability. This study aims to analyze the association between maternal factors and the incidence of PPD in primigravida mothers in Indonesia based on the 2023 Indonesian Health Survey (SKI) data. Methods: This study used a cross-sectional design with the source of data from SKI 2023. The study subjects were 36956 primigravida mothers with infants ≤6 months of age. Postpartum depression was measured using the Indonesian version of the Mini International Neuropsychiatric Interview (MINI). Bivariate and multivariate logistic regression were used to identify factors associated with the incidence of PPD. Results: The prevalence of PPD in primigravida mothers was 6.4%. Factors that were significantly associated with PPD included: region of residence (p = 0.001), abuser relationship (p = 0.001), marital status (p = 0.001), and no antenatal care check-up (p = 0.001). Maternal age, pregnancy complications, and delivery complications showed no statistically significant association with PPD (p > 0.05). Conclusion: These findings can help in the development of policies focusing on community-centered approach, as well as enhanced mental health services for mothers to assist in the prevention of PPD.

Keywords: depression, postpartum, female reproduction, primigravida

INTRODUCTION

Postpartum depression (PPD) is a non-psychotic form of depression experienced by women after childbirth. It is characterized by feelings of deep sadness, excessive fatigue, and difficulty in carrying out daily activities, including care of the newborn[1] . These disorders have the potential to reduce the mother's quality of life, disrupt child development, damage family relationships, and in severe cases, can lead to life-threatening conditions such as suicidal ideation or infanticide[2] . Multiple factors can trigger and exacerbate symptoms of postpartum depression, making it a significant mental health issue[3]

Tackling postpartum depression is in line with the Sustainable Development Goals (SDGs) targets, particularly target 3.4 which emphasizes efforts to reduce premature mortality from non-communicable diseases by one-third through prevention, treatment, and improved mental health and well-being by 2030. [4] . WHO estimates that postpartum depression is experienced by about 13% of mothers worldwide, with higher rates in developing countries including Indonesia, In developing countries, the prevalence of PPD reaches 14% in postpartum women[5] . while in the Sub-Saharan Africa

[1] (Fawcett EJ, Fairbrother N, Cox ML, White IR, 2019)
[2] (Dadi, A.F., Miller, E.R. & Mwanri, 2020)
[3] (Putnick, D. L., Sundaram, R., Bell, E. M., Ghassabian, A., Goldstein, R. B., Robinson, S. L., ... & Yeung, 2020) .
[4] A. Ionescu, G. H., Firoiu, D., Tănasie, A., Sorin, T., Pîrvu, R., & Manta, "Assessing the Achievement of the SDG Targets for Health and Well-Being at EU Level by 2030.," *Sustainability* 12, no. 14 (2020): 5829, https://www.mdpi.com/2071-1050/12/14/5829 .
[5] (Azale, T., Fekadu, A., & Hanlon, 2018)

region it is recorded at 12.2%.[6] . Among Asian women, the prevalence of postpartum depressive symptoms reached 31.8%, making Indonesia one of the countries with the highest PPD risk rates in the Asian region[7] . Making Indonesia one of the countries with the highest risk of postpartum depression in Asia[8] . Despite increasing awareness of the condition, approximately 50% of PPD cases remain undiagnosed. This is largely due to social stigma, limited competent maternal mental health professionals, and limited access to mental health services. As a result, the true burden of postpartum depression is often underestimated, and preventive interventions have not been implemented equally across society[9]

The etiology of PPD is complex and involves various interacting factors. Drastic hormone fluctuations after childbirth, obstetric complications, and traumatic birth experiences are biological factors that are thought to play an important role in triggering PPD[10] . In addition to biological aspects, the psychological transition process to motherhood is also a significant determinant in increasing susceptibility to postpartum depressive disorders[11]

Mental health problems during pregnancy and postpartum can also disrupt mother-infant bonding and parenting practices, increasing the risk of miscarriage, preterm birth, low birth weight, and cesarean section. [12] . The Health Action Plan of the Ministry of Health of the Republic of Indonesia has emphasized the importance of equitable access to health services, including special attention to maternal mental health. However, previous studies in Indonesia have revealed disparities in the prevalence of postpartum depression (PPD) among primigravida mothers. This study aims to examine reproductive factors and postpartum depression among primigravida in Indonesia. The findings of this study are expected to provide input for PPD prevention and treatment strategies on the incidence of PPD in primigravida mothers in Indonesia based on residential groups (urban and rural).

METHOD

Data Source

Data on postpartum depression was obtained from the 2023 Indonesian Health Survey (IHS), organized by the Ministry of Health of the Republic of Indonesia. The IHS is a cross-sectional survey that is conducted every five years and aims to collect basic health indicators to describe the health status of the community at the district / city, provincial and national levels. In the implementation of the 2023 SKI, data collection was carried out in all 34 provinces and 514 districts/cities in Indonesia, using the probability proportional to size (PPS) method. The sampling process was conducted systematically linearly in two stages. The first stage used explicit stratification for census block selection, while the second stage applied implicit stratification at the household level[13]

Subject

The subjects in this analysis were mothers in the 2023 SKI sample who were primigravida postpartum mothers with babies aged≤ 6 months. This study did not include subjects who experienced severe pain and participants who did not provide complete answers to all questions in the questionnaire. The age limit of the child was set at a maximum of 6 months to reduce the potential influence of non-reproductive factors as a cause of depression in mothers after childbirth. Based on these inclusion criteria, a total of 36,956 subjects were eligible for analysis in this study.

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[6] N. Myo, T., Hong, S. A., Thepthien, B. O., & Hongkrailert, "Prevalence and Factors Associated with Postpartum Depression in Primary Healthcare Centres in Yangon, Myanmar.," *The Malaysian Journal of Medical Sciences: MJMS,* 28, no. 4 (2021): 71, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8407790/ .

[7] (Wang, Z., Liu, J., Shuai, H., Cai, Z., Fu, X., Liu, Y., Xiao, X., Zhang, W., Krabbendam, E., Liu, S., Liu, Z., Li, Z., & Yang, 2021)

[8] (Putri, A. S., Wurisastuti, T., Suryaputri, I. Y., Mubasyiroh, 2023a)

[9] (Liu, X., Wang, S., & Wang, 2022) .

[10] (Putri, A. S., Wurisastuti, T., Suryaputri, I. Y., Mubasyiroh, 2023b)

[11] (Psychiatry, 2020) .

[12] Mark H. Yudin and Lori E. Simone N. Vigod, Lesley A. Tarasoff, Barbara Bryja, Cindy-Lee Dennis, "Relation between Place of Residence and Postpartum Depression," *Ross CMAJ* 185, no. 13 (2023): 1129–35, https://doi.org/10.1503/cmaj.122028.

[13] (Hanach, N., Radwan, H., Fakhry, 2023) .

Outcome Variables

The main variable in this study was postpartum depression, which was measured using the Indonesian version of the Mini International Neuropsychiatric Interview (MINI) based on ICD-10. The instrument consists of 10 structured questions, developed to assess psychiatric disorders according to DSM-IV and ICD-10 criteria. The symptoms assessed reflect the respondent's condition in the last two weeks prior to the survey. Scores were given as 1 for 'yes' and 0 for 'no'. Respondents were classified as having depression if they answered 'yes' at least twice in questions 1-3 and twice in questions 4-10. In Indonesia, MINI has a sensitivity of 60-80%, a positive predictive value of 30-60%, a negative predictive value of about 90%, and a moderate level of inter-enumerator agreement (kappa = 0.62)[14]

Independent Variable

The independent variables in this study were reproductive factors including maternal age, occupation, education, marital status, region of residence, pregnancy complications, childbirth complications, postpartum complications, abuser relationship. Age was categorized into at-risk age <20 years and >35 years (code 1), not at-risk age 20-35 years of age. Number of occupations was defined as activities performed by housewives (code 1) and working mothers (code 2). Education was classified as not in school (code 1), did not finish elementary school (code 2), finished elementary school (code 3), finished junior high school (code 4), finished high school (code 5), finished D1-D2-D3 (code 6), finished college (code 7). Marital status is defined as the legal condition of the couple's relationship at the time of data collection categorized into unmarried (code 1), married (code 2), divorced (code 3). Death divorce (code 4). Area of residence is defined as the area where the respondent permanently resides, categorized into urban (code 1) and rural (code 2). Complications during pregnancy, childbirth and postpartum were defined as pathological disorders experienced by respondents related to reproduction and psychiatry, categorized into yes there were complications (code 1), no complications (code 2). Abuser relationship was defined as the relationship between the respondent and the trigger of depression, categorized as husband (code 1), other family (mother, father, biological children, stepchildren, siblings, neighbors (code 2).

Statistical Analysis

The data in this study were analyzed using multiple logistic regression models. Initial data processing on all variables was done univariately. Followed by bivariate analysis with simple logistic regression was performed to determine the relationship of each independent variable with postpartum depression. The p-value indicated a significant association between each variable and postpartum depression. In the next stage, all independent variables that had an association were included as candidates in the multiple logistic regression model All independent variables were hypothesized to be associated with the dependent variable. The association between Postpartum Depression and all independent variables was analyzed using a multivariate logistic regression model, after which the adjusted odds ratio (OR) was calculated. The threshold for statistical significance was set at a p-value <0.05 (i.e., 5% alpha). Analyses were conducted using SPSS version 22.0, taking into account the applicable weights, strata, and primary sample units of the 2023 SKI following the 2023 SKI survey design.

RESULT & DISCUSSION

Table 1. Characteristics of respondents in this study

Variables	N	%
Mother's age		
At Risk	15257	41.7
Not at risk	21339	58.3
Relationship between the perpetrator and the head of household		
Husband	3196	8.7
Family	33400	91.3
Region		
Urban	19340	52.8
Rural	17256	47.2
Marital Status		
Mating	33851	92.5

[14] (Rustiana, E., & Cahyati, 2012) .

Divorce Life	1596	4.4
Death Divorce	1149	3.1
Antenatal Care Status		
Yes Check	17269	47.2
No Check	19327	52.8
Complications of pregnancy		
Yes	13099	35.8
No	23497	64.2
Complications of labor		
Yes	12799	35.0
No	23797	65.0
Postpartum Complications		
Yes	12799	35.0
No	23797	65.0
Jobs		
Housewife	18218	41.8
Working Mom	18378	50.2
Education		
Never been to school	1975	5.4
Not graduated from elementary school	2462	6.7
Graduated from elementary school	6976	19.1
Junior high school graduate	7115	19.4
High school graduate	12410	33.9
Diploma Graduation 1-2-3	2451	6.7
College Graduation	3207	8.8

Table 2. Distribution of Primigravida Mother Factors on postpartum depression

Variables	Not Depressed (n=34068)	Depression (n=2528)	P Value
Mother's age			0.832
At Risk	14198 (41,7)	1059(41,9)	
Not at risk	19870 (58,3)	1469(58.1)	
Relationship between the perpetrator and the head of household			0.001
Husband	2911(8.5)	285(11.3)	
Family	31157(91.5)	2243(88.7)	
Region			0.001
Urban	18103 (53.1)	1237(48.9)	
Rural	15965 (46.9)	1291(51.1)	
Marital Status			0.001
Mating	31573(92.7)	2278(90.1)	
Divorce Life	1457(4.3)	139(5.5)	
Death Divorce	1038(3.0)	111(4.4)	
Antenatal Care Status			0.001
Yes Check	16538 (48.5)	731 (28.9)	
No Check	17530 (51.5)	1797 (71.1)	
Complications of pregnancy			0.325
Yes	12217(35.9)	882 (34.9)	
No	21851(64.1)	1646 (65.1)	
Complications of labor			0.791
Yes	11921(35.0)	878 (34.7)	
No	22147 (65.0)	1650 (65.3)	
Postpartum Complications			0.791
Yes	11921 (35.0)	878 (34.7)	
No	22147 (65.0)	1659 (65.3)	
Jobs			0.001
Housewife	17758 (52.1)	460 (18.2)	
Working Mom	16310 (47.9)	2068 (81.8)	
Education			0.000
Never been to school	885 (2.6)	1090 (43.1)	
Not graduated from elementary school	1657 (4.9)	805 (31.8)	
Graduated from elementary school	6835 (20.1)	141 (5.6)	
Junior high school graduate	6982 (20.5)	133 (5.3)	
High school graduate	12153 (35.7)	257 (10.2)	
Diploma Graduation 1-2-3	2411 (7.1)	40 (1.6)	
College Graduation	3145 (9.2)	62 (2.5)	

Of the 10 variables, 4 variables were not included in multivariate modeling, namely maternal

age, pregnancy complications, delivery complications and postpartum complications due to p-value >0.05.

Table 4. Multivariate Analysis of Multiple Logistic Regression Modeling I Maternal Factors with Postpartum Depression

Variables	Pvalue	OR
Region	0.001	1.423-1.754
KRT perpetrator relationship	0.203	0.686-1.084
Marital Status	0.286	0.932-1.271
Education	0.00	2.278-2.965
Antenatal Care Status	0.01	0.489-0.611
Jobs	0.01	0.225-0.285

In table 2, the p-value >0.05 was obtained in the variable of the relationship between the perpetrator of depression and marital status, so the variable was excluded from the modeling and continued with the assessment of the test of cofounding variables on the variable of the relationship between the perpetrator of depression and marital status based on statistical considerations. The results of statistical considerations obtained change in OR <10% in the variable of relationship between perpetrators of depression and marital status, so it was excluded from multivariate modeling.

Table 5. Multivariate Analysis of Multiple Logistic Regression Modeling II Maternal Factors with Postpartum Depression

Variables	Pvalue	OR
Region	0.001	1.411-1.738
Education	0.00	2.306-3.000
Antenatal Care Status	0.01	0.497-0.620
Jobs	0.01	0.231-0.291
Omnibus Test: pvalue = 0.000	Nagerkerke R square = 4.47	

In the final modeling, the variables that were significantly associated with the incidence of postpartum depression were region of residence, maternal education, antenatal care status, maternal employment. The model formed is declared feasible because it meets the meaning of the model seen from the omnibus test value (pvalue = 0.000). Based on Nagerkerke R square, the value = 0.392 means that the independent variables contained in the model can explain the incidence of postpartum depression by 44.7%. The most dominant variable associated with postpartum depression is education (95% CI OR = 2.306-3.000) meaning that postpartum mothers who have low education are more at risk for postpartum depression than mothers who have high education.

Based on the findings of the study, about 6.9% of primigravida mothers who have babies under six months old experience postpartum depression. The prevalence of PPD is higher in mothers aged 20-35 years, the relationship that triggers the occurrence of DPP is family, the area of residence that often occurs PPD is rural, the marital status that often occurs PPD is the status in marriage, PPD is more often found in mothers who do not have antenatal care checks, PPD is more often found in mothers who do not have pregnancy complications, labor complications, and postpartum complications. PPD was higher among working mothers. PPD predominantly occurs in mothers who have never or do not attend school.

This figure is lower than similar studies in other developing countries, such as in Kabul, Afghanistan, which recorded a prevalence of PPD of 42.5% among primigravida mothers[15] . This difference could be due to variations in social, economic, cultural conditions and the availability of mental health services in each region. This study also uncovered that the prevalence of PPD was higher in the 20-35 age group for mothers. This is also supported by Japanese research which showed that primiparous mothers experienced PPD more than multiparous mothers by a relative risk of 1.76[16] . The age of 20 to 35 years is often characteristic of the segment of the population that is a primiparous mother, so this observation supports the theory that active reproductive ages and the experience of first-time motherhood may increase susceptibility to some form of emotional distress.

Social causatives as well as PPD environmental factors are influential in its emergence. One of the most important findings in this study is the association between family support and risk of suffering from PPD. Mothers with family members who do not offer assistance are likely to experience severe mental pain and anguish in the postpartum period. This is in accordance with literature

[15] (Jamizada, 2024)

[16] (Hoda Alshikh Ahmad, Asem Alkhatib, 2021)

indicating the absence of social support increases the risk of PPD. Furthermore, the region where a person resides also is a contributory factor. This study discovered depression was more prevalent in rural regions. This finding contradicts one study done in Indonesia which stated that PPD was more prevalent in urban areas 5.7% than rural areas 2.9%[17] . This suggests that the role of social environment, access to health services, and local cultural norms may influence the geographic distribution of PPD differently across countries.

Insufficient screening via antenatal care (ANC) increases the risk of developing PPD. Psychiatric issues within ANC care predictive toward PPD were significant with an odds ratio of 4.3. This implies that the intervention during pregnancy should be proactive to mitigate PPD[18] . Somewhat paradoxically, this research showed that PPD was more frequent with mothers who had no complications during the course of pregnancy, delivery, or the postpartum period. Although this appears to deviate from the established framework, it could be other social or psychological factors lacking social support not associated with medical complications. Also, employment situation and level of education impacts risks of PPD. There is perhaps more pressure with working mothers as they need to juggle working and mothering, thus raising the risk of PPD. Moreover, poorly educated mothers often have limited information and inadequate resources to help them deal with the challenges that come after childbirth. As Yunitasari et al., (2023) have pointed out, lower education seems to correlate with a higher risk of PPD.

In general, the findings from this research work reinforce the need for a biopsychosocial framework in understanding and addressing postpartum depression (PPD). Educative health interventions focusing on the mother as well as strengthening family support systems with improved quality of antenatal clinics (ANC) need to be enhanced to manage and prevent PPD, particularly in first time mothers (primigravida).

CONCLUSION

The implications of this study emphasize the urgency of strengthening maternal mental health services, expanding ANC coverage integrated with mental health screening, and empowering women through education and adequate social support. Public health policies should prioritize community-based approaches that address the psychosocial needs of primigravida mothers to prevent and manage postpartum depression comprehensively.

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