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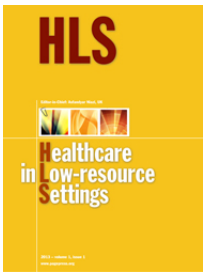

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Characteristics of mothers at risk for perinatal depression in industrial areas

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Abstract

Expectant mothers susceptible to emotional shifts during pregnancy, such as depression, underwent a perinatal phase. Within the first year after giving birth, 10-15% of women experienced specific depressive symptoms. This situation could harm the mother-child relationship. The purpose of this study was to characterize the traits of mothers who might have experienced prenatal depression at Muhammadiyah Gresik Hospital. Purposive sampling and Spearman's rank test analytics were applied to pregnant women between 20 weeks gestation and one month postpartum. Pregnant women with a history of acute medical problems and mental or psychological disorders were excluded. Out of 47 respondents, 59.6% were at risk of perinatal depression. The characteristics studied included religion, ethnicity, maternal age,

educational level, employment status, family income, number of children, mode of delivery, complications during delivery, and depression history. Maternal age (r=-0.314, p=0.032*), employment status (r=0.346, p=0.016*), parity (r=-0.410, p=0.004*), and most recent delivery (r=-0.329, p=0.024*) showed significant correlations with the likelihood of perinatal depression. Maternal age, parity, and mode of delivery had negative correlations, while employment status had a positive correlation. The results of this study can be used as screening tools to identify mothers at risk of perinatal depression. Additionally, it proposes a prenatal and delivery counseling intervention program for both expectant mothers and unemployed women.

Introduction

Depression is a major psychiatric illness that affects many women, with uncertainty remaining over causative factors or etiology.[1] Maternal psychological health, which refers to a woman's mental and emotional well-being during pregnancy, is crucial.[2] Anxiety that cannot be overcome may result in stress and depression.[3] Distress is defined as a pathologic stress condition related to daily life.[4] Perinatal depression occurs frequently, even though the mother and her family may not fully realize it. The perinatal period is a transition for expectant mothers at risk of emotional changes such as depression during pregnancy.[5,6] This phenomenon is experienced by one in seven expectant mothers and is associated with maternal and neonatal morbidity, which can have a significant impact if no intensive action is taken. [7-9] Antenatal services in Indonesia reveal that mental disorders in mothers require initial examination, including by *Posyandu* (integrated health post) cadres or community health workers.[10,11] Stress and anxiety affect each individual differently. In reality, anxiety is not directly caused by a

stressor but rather by the failure to adapt to a stressor.[12] Stress and depression symptoms are measured at baseline and one week before the due date of childbirth.[13]

The prevalence of major and minor depression in the United States is 8.5-11% during pregnancy and 6.5-12.9% in the first year after birth.[14,15] In the *Étude du Développement des Nouveau-nés* (EDEN) study in France, depressive symptoms were observed in 22.5% during pregnancy and 13.6% postnatally.[16] In research on mental health, Munk-Olsen *et al*., based on data obtained from the 2018 *Riskesdas* of the Indonesian Ministry of Health, found that depression often occurs in women of reproductive age.[17,18] Data obtained by Nasri, Wibowo, and Ghozali found that the incidence of postpartum depression in Indonesia was lower than in other countries. In DKI Jakarta, Yogyakarta, and Surabaya, the incidence was found to be 11-30%.[19] Research conducted by O'Hara and Swain found that women who gave birth to their first child experienced puerperal depression at around 13%, occurring in the first year of the puerperium.[20] Other research shows that postpartum depression occurs in around 10-15% of women and is a health problem for women worldwide.[21]

In the postpartum period, 85% of women experience psychological disorders, with 10-15% experiencing significant symptoms.[22] Specific depressive disorders occur in 10-15% of women in the first year after giving birth.[14] Figueiredo, Pacheco, and Costa described a 25% risk of developing perinatal depression in adolescence.[23] Young mothers are more prone to experiencing depression during pregnancy, but a study conducted by Eshbaugh did not find the risk of perinatal depression in adolescents who were not at severe risk.[24] In Indonesia, the incidence of postpartum depression is 11-30%.[25] This phenomenon is more severe than the baby blues and affects 1 in 10 new mothers. A person who has experienced depression has a 30% risk of postpartum depression.[26]

Based on research by Bauman et al. in 2018, the prevalence of postpartum depression was reported to be an average of 13.2%, with higher rates among American Indians/Native Alaskans (22.0%), Asian/Pacific Islanders (19.2%), and black women.[27] This phenomenon will impact the social relationship between the mother and the baby, leading to disruptions and an increase in the incidence of abnormalities in behavior patterns and disturbances in the child's mindset, which can even impact child labor. Mothers with depression are more prone to giving birth to premature babies and are at risk of having low and small final weights. This study aimed to describe the characteristics of mothers at risk of perinatal depression.

Materials and Methods

Research design

The method in this study used a descriptive-analytic approach to describe the characteristics of mothers with perinatal depression.

Study participants

This research was conducted in September 2022 at the obstetric outpatient polyclinic at Muhammadiyah Gresik Hospital for 47 respondents. The sampling criteria for respondents in this study were pregnant women with a gestational age of 20 weeks to 1 month after giving birth and mothers willing to be respondents. Exclusion criteria in this study were pregnant women who experienced mental or psychological disorders and pregnant women with a history of acute medical disorders.

Variable, instrument, and data collection

Data was collected by distributing questionnaires that adjusted the research criteria to include profiles of mothers and Edinburgh Perinatal Depression (EPDS). A non-depressed score of <8 describes the results of the EPDS questionnaire assessment: mild depression with a score of 9-11, moderate depression with a score of 12-13, and severe depression with a score of >14. This instrument has a validity and reliability value of 80.1% and 91-94%, respectively.[19]

Data analysis

This data analysis for this study was carried out univariately to describe the characteristics of the respondents, and a bivariate Spearman rank test was continued to determine the relationship between maternal profile and perinatal depression.

Ethical clearance

This research has passed The Health Research Ethics Committee at the Universitas Muhammadiyah Surabaya conducted the research ethics with the number 029/KET/II.3/AU/F/2022.

Results

Samples from accessible populations at risk of perinatal depression have the characteristics shown in Table 1.

The study surveyed Muslim individuals, mainly Javanese, and found that 66% had basic education, 34% continued it, and 55.33% did not work. Most families had an income below the Regional Minimum Wage (RMW), with 53.11% falling into this category. The study found that 48.9% of participants were experiencing their first pregnancies, and 36.2% had given birth

once before. The characteristics of the last birth were described by 23 people, with 16 normal births and eight cesarean sections. Most respondents had no history of complications or depression.

Table 2 shows that Spearman's rank test analysis reveals no statistically significant relationship between education level, family income, and history of complications with prenatal depression risk. However, the analysis reveals a significant correlation between maternal age, employment status, parity, and the latest delivery, with all variables having a significance level of $p<0.05$.

The study found a moderate relationship between maternal age, parity, and delivery, with negative correlation coefficient values, suggesting that an increase in these variables reduces the risk of perinatal depression. The positive correlation coefficient value indicates that an increase in the employment status variable is associated with an increased risk of perinatal depression.

Discussion

Research at RS Muhammadiyah Gresik revealed that the education level of pregnant women, with basic education at 66% and further education at 34%, did not seem to be associated with a significant risk of prenatal depression. The study aligns with the results of Eshbaugh (2006)., which revealed that mothers with primary education were more likely to experience perinatal depression, while those continuing their education might experience less, but no correlation was found.[28] The high-quality environment and readiness of the mother during pregnancy can contribute to this condition.

These results differ from previous studies by researchers such as Fatmawati and Mukoirotin, which found that low education is associated with perinatal symptoms of depression.[21]

The study by Keliyo *et al.* revealed that individuals with low educational backgrounds are at a higher risk of depression.[29,30] Juwitasari and Marni, on the other hand, found that higher education reduces stress during pregnancy, but the risk of perinatal depression decreases with higher knowledge.[31] This condition can be attributed to mothers who have extensive knowledge about handling pregnancy-related issues and necessary preparations. Education and insight can improve maternal readiness for risk events during pregnancy, reducing the likelihood of depressive events due to inadequate education and insight.[31,32] Higher knowledge and education make it a protective trait for mothers.[33]

A study at Muhammadiyah Gresik Hospital revealed that family income was 34% below RMW, 55.3% at RMW, and 12.8% above RMW. It does not appear to be associated with a significant risk of prenatal depression, showing a negative correlation. A study at Muhammadiyah Gresik Hospital revealed that family income was 34% below RMW, 55.3% at RMW, and 12.8% above RMW. It does not appear to be associated with a significant risk of prenatal depression, showing a negative correlation. Research by Denckla *et al.* (2018) suggests that middle to lower socioeconomic status is a risk factor for perinatal to postpartum depression.[34] Low economic status is associated with and influences the orevalence of postpartum blues.[29,35] Additionally, Fatmawati and Mukhoirotin's study at the Peterongan primary health care revealed that economic factors have a significant impact on perinatal depression.[35] Low economic status can lead to increased social pressure and stress, causing a mental burden for individuals, including mothers undergoing pregnancy. Dagher *et al*.'s study suggests that low family incomes and significant changes in pregnancy conditions can lead to life stresses and depression.[36] Marriage and pregnancy often increase individual needs, leading to increased burdens and depression. Low-income families experience stress and hormonal changes during pregnancy, leading to depression during and after childbirth.[14,26]. Interestingly, Khanam R. *et al.* (2022) obtained different results, revealing that perinatal depression is more

prevalent in families with high incomes, especially in mothers who give birth to low birth weight babies.[22]

The study at Muhammadiyah Gresik Hospital reveals that a history of complications does not appear to be related to the risk of prenatal depression. Perinatal depression is prevalent in all pregnant women without complications, while less common in those with complications, indicating no link between birth complications and depression risk.[37] During pregnancy, the mother's condition can be positively influenced by receiving sufficient social support from her partner, sibling, or friends. Postpartum complications can lead to increased anxiety,[38] depression, and self-destruction in mothers, exacerbated by extreme fatigue and pain during childbirth and postpartum care.[26] Research at RS Muhammadiyah Gresik revealed a correlation between maternal age and the risk of perinatal depression in pregnant women, with high levels in mothers aged 20-35 years and low levels in mothers over 35 years. This study aligns with the Indonesian Ministry of Health's Riskesdas data, which reveals that depression mainly occurs in women of childbearing age.[18] The studies of Denckla *et al*. and Nicolet *et al*. (2018) found a high prevalence of perinatal depression in young mothers. Research by Lie *et al*. (2018) shows that most individuals in the productive age group experience depression during pregnancy due to the transition from adolescence to adulthood.[34,39] This condition triggers depression in mothers because of changes in the transition from adolescence to adulthood and a lack of experience in preparing for pregnancy.[39] This condition can be caused by young pregnant women who do not have the health knowledge needed during pregnancy.

Pregnancy provokes a crisis of maturation, weakening mental defenses, transforming self-image, and potential conflicts with femininity. Age can trigger depression, especially in younger mothers. Parenting early can disrupt emotional stability and the transition from adolescence to adulthood.[39,40] Depression is a psychological disorder characterized by

symptoms such as low mood, anhedonia, weight loss, decreased interest, rumination, insomnia, and thoughts of self-harm.[14] According to studies by Bjelica *et al*., perinatal depression symptoms can be observed in individuals over 30 years of age, albeit with a low incidence rate.[39] As a mother ages, she experiences mental and emotional maturation, increasing her understanding of parenthood and forming more efficient patterns of maternal behavior.[25,34]

Perinatal depression can occur in young pregnant women due to their lack of readiness for hormonal changes during pregnancy, unlike Mwita *et al*.'s finding that it can occur at any age.[33] Older individuals are at a lower risk of depression as they age, fostering emotional and psychological maturity, allowing parents to form good maternal behavior patterns.[25,34] Research at RS Muhammadiyah Gresik revealed a significant correlation between the employment status of working and non-working mothers (44.7%, 55.3%) and the risk of prenatal depression.

This research is in line with findings conducted by Mwita *et al*. (2021) who found that maternal employment status can influence the incidence of perinatal depression, with the risk being higher for working mothers than for housewives.[33] Studies by Kusuma (2017) show a correlation between a mother's job and the incidence of postpartum depression, suggesting that physical preparation for work and child care is crucial.[41] Mothers' readiness for postpartum care, worries, and physical fatigue can trigger depression, affecting their ability to care for themselves and their babies postpartum.

Pregnancy and childbirth often trigger psychological preparation for motherhood, leading to symptoms of depression, fatigue, and pressure to meet the baby's needs, causing stress and an increased individual burden on the mother.[14,20] The study revealed that a mother's employment status significantly impacts her likelihood of experiencing depression during pregnancy, influenced by her physical readiness and postpartum preparedness.[42]

Keliyo and Wodajo's (2021) research reveals that mothers with less childbirth experience have a higher risk compared to those with more experience.[29] Khanam *et al.* (2022) suggest that pregnancy-induced depression is more common in mothers who have not received psychological preparation.[22] Birth trauma and complex events during childbirth can cause stress and depression, impacting the mother's subsequent pregnancy.[34] Hormonal changes during pregnancy can cause mood swings in the mother, while lack of experience and readiness can trigger perinatal depression in primigravida women.[35,39] Memories during birth can lead to depressive disorders, affected by childbirth and stress. These physiological reactions affect the nervous, endocrine, and immunological systems, leading to adverse postnatal outcomes.[43,44]

Research at RS Muhammadiyah Gresik revealed a significant negative correlation between prenatal childbirth, normal childbirth, and cesarean section (48.9%, 34.0%, 17.0%) and the risk of prenatal depression. Similar findings with Keliyo and Wodajo (2021) revealed that primigravida mothers who had never given birth had an eightfold risk of developing depression during pregnancy.[29] Primigravida mothers lack experience, leading to a negative maternal attitude during pregnancy. Cesarean delivery increases the risk of postpartum depression 3.7 times compared to spontaneous delivery.[42] A study by Ismail (2003) found that perinatal depression can be caused by physical trauma during childbirth, especially cesarean delivery, which takes longer to heal.[19] In contrast, Ariyanti (2015) found that mothers who gave spontaneous birth were at a higher risk of postpartum depression.[42] Childbirth trauma can cause depression in mothers, affecting mood, stress, and anxiety during labor and postnatal healing.[43] Berry *et al*. (2021) suggest that the likelihood of perinatal depression is high in primigravida pregnant women, while it is lower in those who have spontaneous births.[45]

In this study, none of the respondents had a history of depression or family depression, so analysis of the Chi-square relationship could not be done. Dagher *et al.*'s (2021) opinions coherently illustrate that perinatal depression can occur and is associated with depression,

anxiety, lack of family support, and marital status.[36] Previous research shows that pregnant women who have a history of psychological disorders have a higher chance of experiencing perinatal depression.[29] During the perinatal period, the mother's body undergoes emotional, psychological, and cognitive changes characterized by mood swings and decreased verbal function in the mother.[26] Lack of support for the mother during pregnancy, coupled with the presence of psychological disorders, can lead to perinatal depression and potentially affect the developing fetus.[39]

The study's limitations include its focus on people residing in industrial districts, which means it may not accurately represent the entire city's population. Therefore, additional research is required to supplement the findings of previous studies, and it is important to choose locations with distinct population characteristics to determine whether the outcomes of the present study will remain the same or differ. In this study, the incidence of prenatal depression risk was found to be linked with maternal age, work status, parity, and the latest delivery.

Conclusions

The study found no significant correlation between the risk of prenatal depression and factors such as family income, education, or past difficulties. However, an increased risk was strongly associated with maternal age, unemployment, number of previous births, and the nature of the prior birth (*e.g.*, C-section). Particularly vulnerable to prenatal depression risk are first-time mothers and those pregnant at a very young or advanced maternal age. The study suggests using its findings to screen for the risk of prenatal depression and to create counseling programs for pregnant women and support systems for expectant mothers who are unemployed to potentially reduce postpartum depression risk.

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Table 1. Distribution of respondents' characteristics.

No	Characteristics		F	%
1	**Religion**	Islam	47	100
		Non-Islam	0	0
2	**Ethnicity**	Javanese	40	85.1
		Sundanese	2	4.3
		Batak	0	0
		Madurese	3	6.4
		Banjar	0	0
		Bali	0	0
		Betawi	1	2.1
		Minangkabau	1	2.1
		Bugis	0	0
		Melayu	0	0
3	**Age (years old)**	<20	0	0
		20-35	40	85.1
		>35	7	14.9
4	**Education**	Basic education (Elementary to Senior High School)	31	66
		Further education (Diploma/Bachelor/ Master/Doctorate)		
			16	34
5	**Job-status**	Unemployed	26	55.3
		Employed	21	44.7
6	**Family income**	Below Regional Minimum Wage (RMW)	16	34
		Equivalent to RMW	25	53.2
		Above RMW	6	12.8
7	**Parity (x times)**	0	23	48.9
		1	17	36.2
		2-5	7	14.9
		>5	0	0

8	**Last delivery**	Never	23	48.9
		Normal	16	34
		Cesarean section	8	17
9	**Complication history**	No	45	95.7
		Yes (prolonged labor, postpartum bleeding)	2	4.3
10	**Depression history**	Noting	47	100
		Yes	0	0
11	**Family depression history**	Noting	47	100
		Yes	0	0
12	**Perinatal depression risk**	Not depressed	19	40.4
		Possible depression	18	38.3
		The probability of depression is relatively high	8	17
		Depression is very likely	2	4.3

Table 2. Spearman rank test analysis of the relationship between participant characteristics and perinatal depression.

Participant characteristics		**Perinatal depression risk**				**Correlation coefficient (r)**	**p-value**
		<8	9-11	12-13	≥14		
Age (years old)	<20	0	0	0	0	-0.314	0.032*
	20-35	13	18	7	2		
	≥35	6	0	1	0		
Education	Basic education	10	13	6	2	-0.243	0.100
	Further education	9	5	2	0		
Job-status	Unemployment	15	7	3	1	0.346	0.016*
	Employment	4	11	5	1		
Family income	Below RMW	3	8	4	1	-0.210	0.157
	Equivalent RMW	14	8	2	1		
	Above RMW	2	2	2	0		
Parity (x times)	0	4	12	6	1	-0.410	0.004*
	1	11	3	2	1		
	2-5	4	3	0	0		
	>5	0	0	0	0		
Complication history	No	19	17	7	2	0.183	0.218
	Yes (Prolonged labor, postpartum bleeding)	0	1	1	0		
Last delivery	Never	6	11	5	1	-0.329	0.024*
	Normal	6	7	2	1		
	Cesarean section	7	0	1	0		
Perinatal depression risk		≤8		Not depressed			
		9-11		Possible depression			
		12-13		The probability of depression is relatively high			
*significant (p<0,05)		≥14		Depression is very likely			

RMW, Regional Minimum Wage

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