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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.

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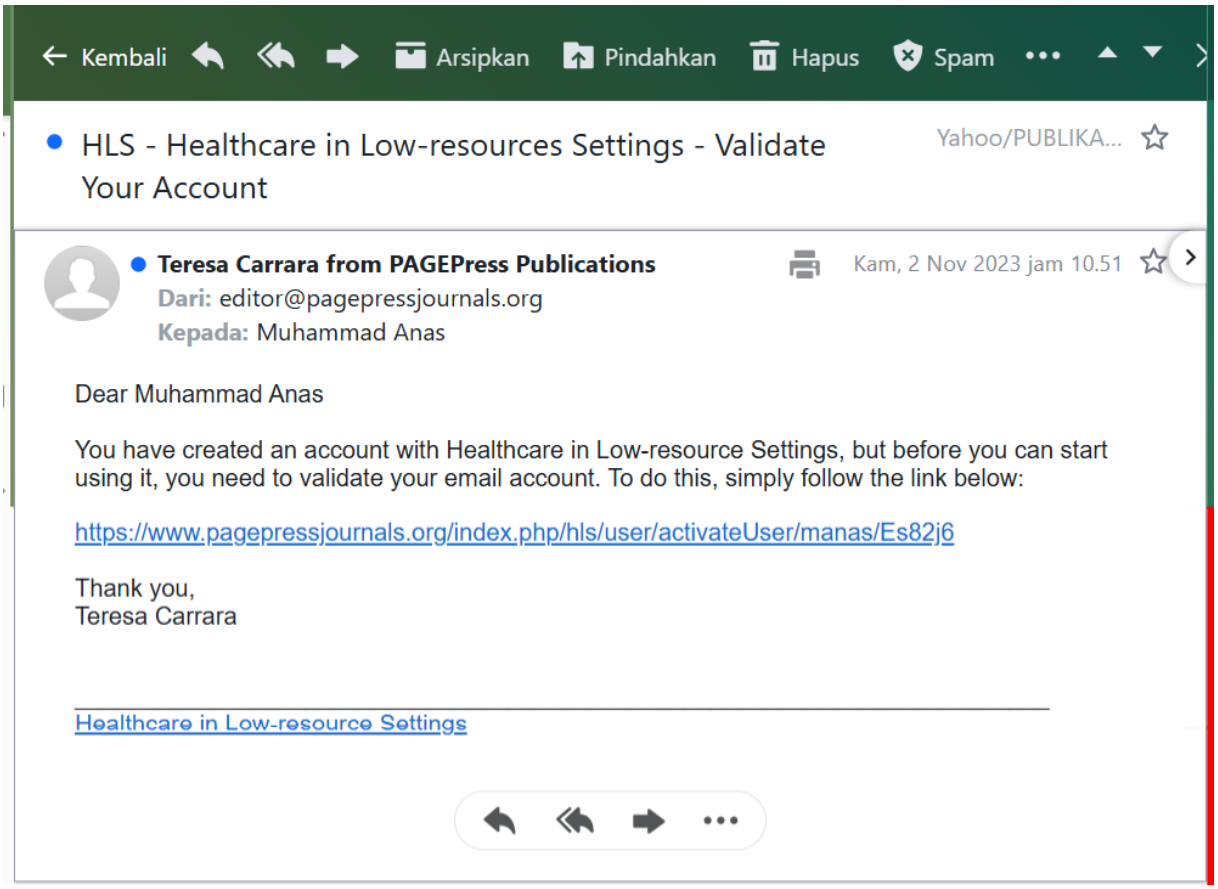

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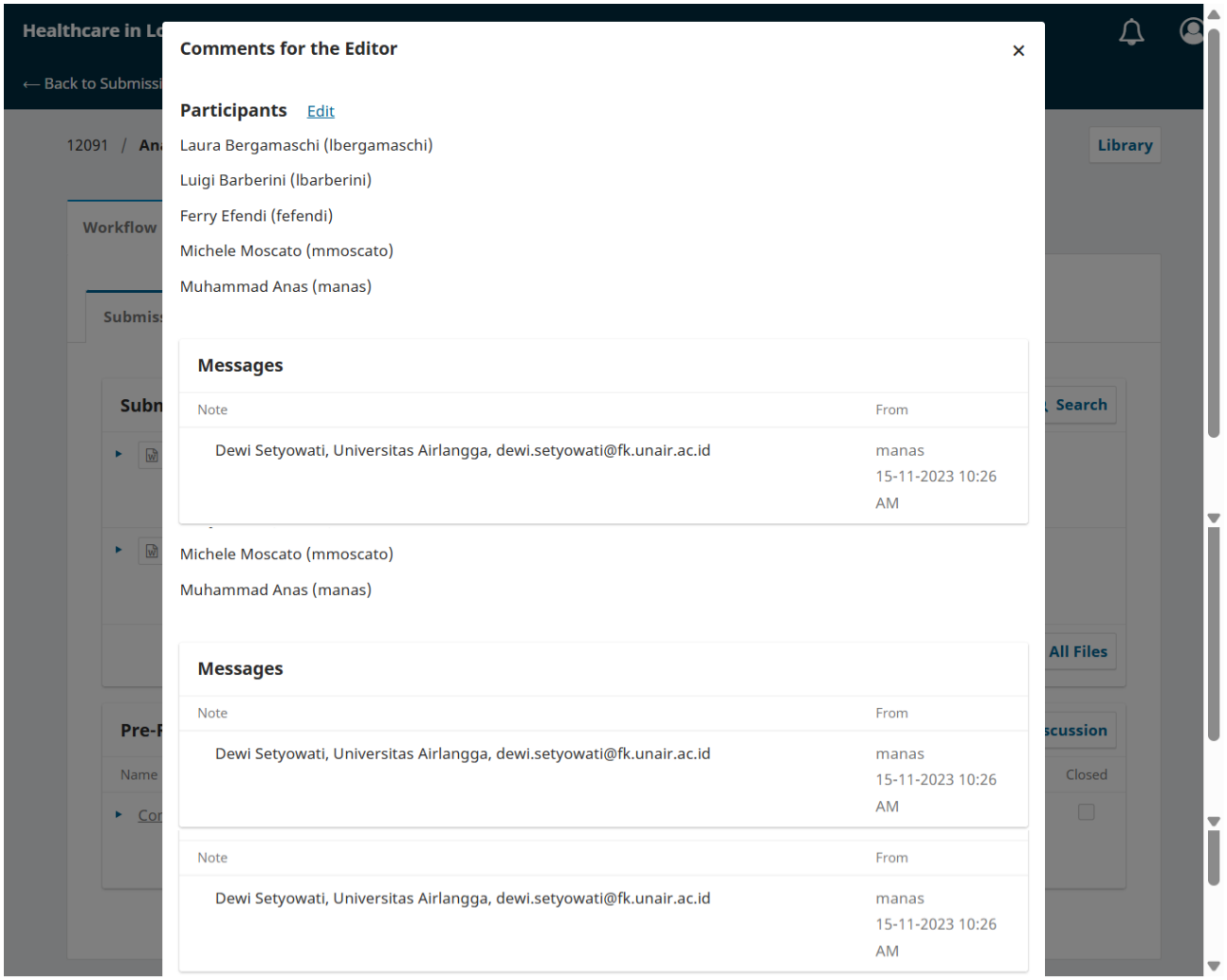
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Characteristics of Mothers at Risk for Perinatal Depression in Industrial Areas

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Contributions:

This study was conducted and designed by MA, MDA, ECP and UM. MDA, ECP and UM performed sample collection. MA, MDA, ECP and UM analysed data and wrote the manuscripts. All authors read and approved the final manuscript.

Conflict of interest:

The authors declare no conflict of interest.

Ethics approval and consent to participate:

The research has received ethical approval from the Health Research Ethics Commission, the University of Muhammadiyah Surabaya During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence and non-maleficence.

Patient consent for publication:

Written informed consent was obtained for anonymized patient information to be published in this article.

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All data generated or analyzed during this study are included in this published article.

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ABSTRACT

Background: A perinatal period is a change in expectant mothers prone to emotional changes such as depression during pregnancy. Specific depressive phenomena occur in 10-15% of women in the first year of childbirth. This condition harms the interaction between mother and child. This study aims to describe the characteristics of mothers with a risk of perinatal depression. This research was conducted at Muhammadiyah Gresik Hospital.

Method: The type of research used in this research is descriptive analytics. The sampling technique uses non-probability sampling with purposive sampling type. The research sample used was pregnant women with a gestational age of 20 weeks to 1 month after giving birth who were willing to become respondents. The exclusion criteria were pregnant women who experienced mental or psychological disorders and had a history of acute medical disorders.

Result: Of the 50 respondents, 30 (60.0%) were depressed. 50 (100.0%) were Muslim mothers, 43 (86.0%) came from Java, 2 (4.0%) came from Sundanese, 3 (6.0%) came from Madura, 1 (2.0) %) came from Berawi and 1 (2.0%) came from Minangkabau, 42 (84.0%) mothers were in the age range of 20-35 years, 8 (16.0%) were mothers over 35 years old, 33 (66 .0%) mothers with basic education (Elementary to Senior High School), 17 (34.0%) mothers with further education (Diploma/Bachelor/ master/ doctorate), 27 (54.0%) mothers with no work, 23 (46) .0%) working mothers, 17 (34.0%) families with an income below the minimum wage, 27 (54.0%) families with an income equal to the minimum wage, 6 (12.0%) families with income above the minimum wage, 25 (50.0%) mothers who have never given birth, 18 (36.0%) mothers with one delivery, 7 (14.0%) mothers who have given birth 2-5 times, 17 (34.0%) last normal delivery, 8 (16) the last .0%) delivered by cesarean section, 47 (94.0%) did not have labor complications, 3 (6.0%) had complications during delivery, no history of depression was found and family depression on respondents.

Conclusion: The most common characteristics of perinatal depression occur at the age of 20-35 years, have basic education, working mothers, have a family income below the UMR (low), mothers who

have never given birth, mothers who previously gave birth normally or spontaneously, and can occur in mothers who do not have a history of complications and a history of depression and heredity.

Keywords: Perinatal depression, characteristics, risks, mothers, industrial areas

INTRODUCTION

The perinatal period is a transition for expectant mothers at risk of emotional changes such as depression during pregnancy. This phenomenon will be experienced by one of the seven expectant mothers who are associated with maternal and neonatal morbidity, which is influential if no action is taken intensively. Based on 2005 national data, 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 of birth [1,2]. In research on mental health, Munk-Olsen *et al*., 2006 and based on data obtained from the 2018 Riskesdas of the Indonesian Ministry of Health, it was found that depression often occurs in women of reproductive age [3,4].

Data obtained by Nasri, Wibowo, and Ghozali, 2017 found that the incidence of postpartum depression in Indonesia was lower than in other countries, such as in 1998–2001 in DKI Jakarta, Yogyakarta, and Surabaya, the incidence was found to be 11–30%[5]. Research conducted by O'Hara, M, W & Swain, A, 1996, found that women who gave birth to their first child experienced puerperal depression around 13% which occurred in the first year of the puerperium[6]. Other research shows that postpartum depression occurs in around 10–15% of women and is a health problem for women worldwide[7].

In the postpartum period, 85% of women experience psychological disorders, and 10-15% experience significant symptoms[8]. Specific depressive disorders occur in 10-15% of women in the first year after giving birth[1]. In 2007, Figueiredo, Pacheco, and Costa described a 25 percent risk of developing perinatal depression in adolescence. Young mothers are more prone to experiencing depression during pregnancy, but a study conducted by Eshbaugh in 2006 did not find the risk of perinatal depression in adolescents who were not at severe risk. In Indonesia, the incidence of postpartum depression is 11-30%[9]. 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[10].

Based on research by Bauman *et al*. in 2018, the prevalence of postpartum depression was reported to

be an average of 13.2% and higher among American Indians/Native Alaskans (22.0%), Asian/Pacific Islanders (19.2%), and black women. (18.2%), while women with white skin (11.4%)[11]. This phenomenon will impact the social relationship between the mother and the baby, which will be disrupted, which will cause 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 give birth to premature babies and are at risk of having low and small final weights. This study aims to describe the characteristics of mothers with a risk of perinatal depression.

METHODS

This research was conducted in September 2022 at the obstetric outpatient polyclinic at Muhammadiyah Gresik Hospital. The method in this study used a descriptive-analytic approach to describe the characteristics of mothers with perinatal depression. The criteria for respondents in this study were pregnant women with a gestational age of 20 weeks to 1 month after giving birth and mothers who were 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.

Data was collected by distributing questionnaires to 47 respondents who had adjusted the research criteria to contain 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 %[5].

Data analysis in this study was carried out univariately to describe the characteristics of the respondents and continued with a bivariate test with the spearman rank test to determine the relationship between maternal profile and perinatal depression. The Health Research Ethics Committee at the University of Muhammadiyah Surabaya conducted the research ethics.

RESULTS

Table 1 Frequency Distribution of Research Respondents' Characteristics

No	Characteristics		F	%
1	Religion	Islam	47	100,0
		Non-Islam	0	0
2	Ethnic	Javanese	40	85,1
		Sundanese	2	4,3
		Batak	0	0,0
		Madurese	3	6,4
		Banjar	0	0,0
		Bali	0	0,0
		Betawi	1	2,1
		Minangkabau	1	2,1
		Bugis	0	0,0
		Melayu	0	0,0
3	Age (years old)	<20	0	0,0
		20-35	40	85,1
		>35	7	14,9
4	Education	Basic education (Elementary to Senior High School)	31	66,0
		Further education (Diploma/Bachelor/ Master/Doctorate)	16	34,0
5	Job-status	Unemployment	26	55,3
		Employment	21	44,7
6	Family Income	Below UMR	16	34,0
		equivalent UMR	25	53,2
		Above UMR	6	12,8
7	Parity (x times)	0	23	48,9
		1	17	36,2
		2-5	7	14,9
		>5	0	0,0
8	Last delivery	Never	23	48,9
		Normal	16	34,0
		Sectio Caesarea	8	17,0
9	Complication history	No	45	95,7
		Yes (Prolonged labor, postpartum bleeding)	2	4,3
10	Depression history	Noting	47	100,0
		Yes	0	0,0
11	Family Depression history	Noting	47	100,0
		Yes	0	0,0
12	Perinatal Depression Risk	Not depressed	19	40,4
		Possible depression	18	38,3
		The probability of depression is relatively high	8	17,0
		Depression is very likely	2	4,3

The results of the description of religious characteristics were obtained by 47 people who are Muslim.

The description of ethnic characteristics was obtained by 40 Javanese, 2 Sundanese, 3 Madurese, 1

Betawi, and 1 Minangkabau. A description of the characteristics of the vulnerable age of 20-35 years was obtained from 40 people and seven people aged >35 years. Most (31 people) have mothers with basic education, and 16 people continue their further education (Diploma/Bachelor/Master/Doctorate). Based on the characteristics of the mother's work, it was found that 26 people did not work, and 21 people worked. Most families had the same income as UMR (25 people), 16 people were below UMR, and six were above UMR.

Based on the description of parity characteristics, it was found that 23 people were first pregnancies (0 times), 17 people had given birth once, and seven people had given birth 2-5 times. The results of the description of the characteristics of the last birth were obtained by 23 people who had never given birth, the last 16 people who gave birth normally, and the last eight people who gave birth by cesarean section. Most (45 people) had no history of complications, and 2 had complications in previous deliveries. In this study, no respondents had a history of depression or a family of depression.

Table 2 shows the results of the spearman rank test analysis of the relationship between characteristics and perinatal depression

Characteristics		Perinatal Depression Risk				Correlation coefficient (r)	p
		<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 UMR	3	8	4	1	-0,210	0,157
	equivalent UMR	14	8	2	1		
	Above UMR	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
Sectio Caesarea	7	0	1	0
Perinatal Depression Risk	<8=		Not depressed	
	9-11=		Possible depression	
	12-13=		The probability of depression is relatively high	
*=signifcant (p<0,05)	>=14=		Depression is very likely	

Table 2 shows Spearman's rank test analysis results, variable education level r=-0.234 p=0.100, family income r=-.0210 p=0.157, history of complications r=0.183 p=0.218. The three variables had a significance level of p>0.05, which did not mean that there was a relationship between education level, family income, and history of complications with the risk of perinatal depression.

Table 2 shows the analysis of Spearman's rank test variable maternal age r=-0.314 p=0.032*, employment status r=0.346 p=0.016*, parity r=-0.410 p=0.004*, and last delivery r=-0.329 p=0.024 *. The four variables have a significance level of p <0.05 which means that there is a significant relationship between maternal age, employment status, parity, and last birth with the risk of perinatal depression.

The correlation coefficient values obtained were -0.314, -0.410, and -0.329 belonging to the "moderate relationship" category because they are in the correlation level between 0.26-0.50. The value of the correlation coefficient was negative for maternal age, parity, and delivery variables, meaning that if the values of these three variables increase, the risk of experiencing perinatal depression decreases. Meanwhile, the correlation coefficient value was found to be positive for the employment status variable, which means that if the value of this variable increases, the risk of experiencing perinatal depression also increases.

DISCUSSION

This study shows a relationship between maternal age and the risk of perinatal depression in pregnant women at Muhammadiyah Gresik Hospital. This study also found that mothers who have a very high

probability of depression in almost all mothers aged 20-35 years and very few mothers over the age of 35 have a very high probability of depression score, while depression is very likely to occur in all mothers aged 20- 35 years old. This research is in line with data found by Riskesdas of the Indonesian Ministry of Health (2018), which found that depression predominated in women of childbearing age[4]. Similar findings were also made in a study by Denckla *et al*. (2018). The incidence of depression was found more in mothers under the age of 23 compared to their peers who were not pregnant[12]. This condition can be caused by younger pregnant women who lack the health knowledge needed during pregnancy.

Another finding by Nicolet *et al*. found a high incidence of perinatal depression in young mothers and young pregnancies[7]. The findings also align with Li *et al*. in 2020 to analyze the correlation between maternal age and depression, and both have a significant effect[13]. This condition triggers depression because the mother will experience transitional changes from adolescence to adulthood and can be caused by a lack of experience regarding preparation for pregnancy[14]. This incident can occur because pregnant women at a young age are not medically and mentally ready to deal with hormonal changes during the perinatal period, so the risk of this pregnancy will be more at risk of experiencing perinatal depression. In contrast to the findings made by Mwita *et al*. (2021), the incidence of perinatal depression can occur at any age of the mother[15]. The incidence of depression in the elderly is at lower risk because increasing maternal age will increase emotional and psychological maturity so that parents can know the role and form patterns of good maternal behavior[9,12].

During pregnancy, a maturation crisis occurs, which can be found in the reflection phase, weakening mental defense mechanisms, self-image transformation, and potential conflict with femininity. Age can be a trigger factor for depression during pregnancy. Especially for mothers who have a younger age, it will be a predictor of distress that occurs in the middle of pregnancy. At an early age, becoming a parent can cause obstacles during the transition from adolescence to adulthood and impact the emotional stability of each individual[14,16]. Depression can be interpreted as a psychological disorder

with findings such as depression, anhedonia, decreased body weight, decreased interest, brooding, insomnia, and no appetite or concentration, and it can also be found as feeling like ending one's life[1].

In this study, it was found that most of the productive age had depression scores during pregnancy. This finding is in line with research by Lie *et al*., 2020; most productive ages experience depression during pregnancy[13]. Younger ages have a higher risk of experiencing depressive symptoms during pregnancy to postpartum because, at a young age, there is a process of transition from adolescence to adulthood accompanied by a lack of experience in a new role[12,14]. However, symptoms of depression during pregnancy can also be found at the age of over 30 years. This finding is in line with an analysis by Bjelica *et al*, who found that over 30 years of age experienced perinatal depression but had a low incidence rate[14]. As the mother ages, she will experience an increase in mental and emotional maturation so that she can understand her role as a parent and will form more efficient patterns of maternal behavior[9,12]. The test results above obtained a significant relationship between education level and perinatal depressive symptoms. This study follows the findings analyzed by Fatmawati and Mukoirotin found that low education has a significant relationship to symptoms of perinatal depression[17]. Another study by Keliyo *et al*, also found similar things with a low educational background at a high risk of experiencing depression[18,19].

Based on the results of this study, it was found that almost all of the respondents with basic education had a high probability of perinatal depression and perinatal depression was very likely to occur, while very few perinatal depression might occur in mothers who had an advanced educational background. In this study, it can be found that there is no relationship between the mother's education level and the risk of perinatal depression. This study agrees with the conclusions looked at by Li *et al*, Maternal education level and the likelihood that pregnant women experience perinatal depression did not correlate[20]. This condition may be brought on by the mother's high quality of environment and readiness during pregnancy.

Similar findings in Keliyo and Wodajo's research in 2021 revealed that mothers with low education

had a higher risk of experiencing perinatal depression than mothers with higher education[18]. Pregnancy at a young age can interrupt mothers' schooling, so efforts to explore knowledge and information related to preparation for pregnancy and psychological preparation for childbirth are minimal for pregnant women. Mothers with higher education will easily understand reproductive health information so that they can reduce stress during pregnancy. In contrast, the results found in Juwitasari and Marni's research in 2020 obtained a negative correlation coefficient value which means that the higher the knowledge possessed by pregnant women, the lower the risk of experiencing perinatal depression[21]. This condition can be due to mothers with extensive knowledge of dealing with problems and preparations needed during pregnancy.

Education influences the psychological aspects and insights of a mother undergoing pregnancy. The lower the level of education, the more vulnerable to experiencing perinatal depression[18]. Education and insight will lead to a more prepared attitude towards risk events during pregnancy. Depressive events during pregnancy occur because the mother has not received adequate education or insight, so the mother is not ready during the pregnancy process[21,22]. High knowledge and education can be a preparedness or preventive measure in the incidence of depression during pregnancy and become a protective trait for the mother[15]. This study found that the probability of perinatal depression was relatively high in almost half of the pregnant women who did not work and that most working mothers had a high probability of experiencing perinatal depression. In contrast, half of the pregnant women might experience perinatal depression in mothers who did not work and workers. The analysis of this study found a relationship between the mother's employment status and the risk of perinatal depression.

This research is in line with the findings conducted by Mwita *et al*., to find that the mother's employment status can affect the incidence of perinatal depression, and the risk is higher for working mothers than for homemakers[15]. This condition can cause mothers to have to prepare more physically to return to work and care for the children they contain. Similar studies have shown a relationship between a mother's work and the incidence of postpartum depression found in a study conducted by

Kusuma in 2017[23]. This condition is related to the readiness that mothers have from the beginning of giving birth to facing the postpartum period, starting to worry during childbirth, and continuing to protect themselves and their babies until postpartum regarding baby care and how to breastfeed. Physical fatigue from caring for the baby all day after giving birth can trigger symptoms of depression.

A woman's psychological preparation for her new role as a mother is often associated with pregnancy and childbirth. Working mothers can trigger depressive phenomena during pregnancy which can cause mothers to experience ongoing fatigue while caring for their babies. This condition can cause the mother to experience pressure to meet the baby's needs, thus stressing the mother. During pregnancy, the needs of each individual also increase and will burden the mother[1,6]. This study found that the mother's employment status variable influenced the incidence of depression during pregnancy. This condition can be related to the physical aspect of the mother, who requires physical preparation to return to work after giving birth, and is related to the mother's readiness from the beginning of the birth process until facing the postpartum period[23,24].

Based on the results of this study, the possibility of perinatal depression is relatively high in half of those with income below the UMR and very few in families whose income is equivalent to the UMR and above the UMR. In contrast, perinatal depression is likely to occur in families with incomes below the UMR and equivalent to the UMR. The results of this study did not show a relationship between family income and the risk of perinatal depression. They obtained a negative correlation coefficient which means that the higher the family income, the lower the risk of experiencing perinatal depression in pregnant women. Research conducted by Denckla *et al*..in 2018 revealed that middle to lower socioeconomic status is a risk factor for perinatal to postpartum depression[12]. The same thing was found in research that revealed low economics was related to and influenced the incidence of postpartum blues[25,26].

This study differs from the findings of Khanam *et al*., 2022, which found that perinatal depression was more common in families with middle to high incomes than families with low incomes. This study

also found that the risk of depression during pregnancy was higher in families with high incomes[8]. In the findings of Fatmawati and Mukhoirotin., 2017 at the Puskesmas in the working area of the Peterongan sub-district, it was found that economic factors had a significant effect on perinatal depression[17,27]. In conditions of low economic status, it will cause more social pressure or stress, making it a mental burden for every individual, including mothers undergoing an ongoing pregnancy.

The unstable condition of the economic wheel disrupts aspects of the social and physical life, which causes difficulties in dealing with problems due to economic pressures in that individual's life. Economic pressure is also used as a reference for subjective feelings of pressure or suffering associated with views of the insufficiency of financial resources to meet family needs[17]. Low family economic income can cause life pressure (stress) in the household, and the condition of the mother during pregnancy experiences significant changes, so both of them can cause depression during pregnancy to postpartum. This finding is in line with what was found in a study by Dagher *et al*., 2021, which revealed stress factors or life pressures to be a cause of perinatal depression[28]. Marriage and pregnancy increase the needs of each individual, which causes burden and triggers depression.

Family income has a significant value of $p < 0.05$ which significantly affects perinatal depression. The same thing is found in low economic relations and can affect the incidence of postpartum blues[25]. Under conditions of low-income families, it will cause pressure (stress) in the household, and when the mother during pregnancy experiences significant hormonal changes, both cause depression during pregnancy to postpartum[1,10]. This study found that the possibility of perinatal depression was relatively high in some pregnant women who had never given birth (0 times) and very few in primiparous women. In comparison, perinatal depression was likely to occur in half of the pregnant women who had never given birth (0 times) and primiparous women. This study found a relationship between parity and the risk of perinatal depression. The value of the correlation coefficient shows a negative result which means that the more birth experiences experienced by the mother, the lower the risk of perinatal depression.

The same findings can be found in Keliyo and Wodajo's research in 2021, where mothers with less experience of childbirth have a higher risk than mothers who have given birth or have had more experience of giving birth[18]. This condition happens because primigravida mothers do not know the necessary psychological preparations to prevent hormonal changes during pregnancy. Whereas to Khanam *et al*. 2022, mothers who have given birth experience an increased risk of experiencing depression during pregnancy[8], this condition can be caused by trauma during the birth process that the mother experienced. During the delivery process, a complex event can cause stress to the mother because, during the delivery process, it can leave trauma that impacts subsequent pregnancy depression[12]. During pregnancy, significant hormonal changes can cause mood swings in the mother. Lack of experience and readiness during pregnancy can trigger perinatal depression in primigravida women[14,17].

Based on the results of this study, it was found that the possibility of perinatal depression was relatively high in almost all pregnant women who did not have a history of previous complications and very few in mothers who had complications. In contrast, perinatal depression was very likely to occur in all pregnant women who did not have a history of birth complications. This study shows that a history of birth complications is not associated with the risk of perinatal depression. This study is in line with the findings studied by Li *et al*. 2020 showing results that there is no relationship between the incidence of perinatal depression and high-risk pregnancies[13]. This condition can happen because the mother gets good social support. This condition can come from a partner, sibling, or friends needed by the mother during pregnancy.

In contrast to the findings by Khanam *et al*. 2022, it was shown that mothers who have given birth would increase the incidence of depression during subsequent pregnancies[8]. Memories can cause this condition during the birth process that the mother experienced. Labor and stress have directly affected the outcome of pregnancy through physiological reactions involving the nervous, endocrine, and immunological systems. When labor takes place, it can be a bad experience for the mother, and

recurrent depressive disorders can occur after giving birth, even if the child is in good health[29,30].

Postpartum complications can trigger increased anxiety, depression, and thoughts of self-destruction in mothers who experience mood disorders after delivery. This condition can be caused by extreme fatigue during childbirth and pain from postpartum complications, even though the mother has to go through the process as responsible for caring for the baby[10].

This study found that the possibility of perinatal depression was relatively high in some pregnant women who had never given birth and very few in women who had given birth spontaneously or normally. In contrast, perinatal depression was likely to occur in half of the pregnant women who had never given birth and women who had given birth vaginally or spontaneously. This study also shows a moderate association between the last delivery and the risk of perinatal depression.

Findings similar to those of Keliyo and Wodajo in 2021 reveal that primigravida mothers who have never given birth have an eightfold risk of experiencing depression during pregnancy[18]. Primigravida mothers have not had mature experience, so they do not create good maternal attitudes during pregnancy. In contrast to the findings by Ariyanti and Ari in 2016, cesarean delivery had a 3.7 times greater risk of experiencing postpartum depression than mothers who delivered normally or spontaneously[25]. This condition is due to the physical trauma the mother receives during childbirth, which affects the mother's psychology. Mothers with cesarean deliveries take longer to heal, which can delay the mother from carrying out her new role as a mother figure, so mothers with cesarean deliveries are at risk of experiencing depression.

Another study by Tri and Rofingatul Mubasyiroh in 2020 found a relationship between the delivery method and the incidence of perinatal depression[5]. This opinion is in line with Ririn, Detty, and Dhesi in 2015, who revealed that mothers who give birth normally or spontaneously are at greater risk of experiencing postpartum depression than mothers who deliver by cesarean section[25]. During labor, it can leave trauma during the birthing process, which causes the mother to experience depression. This

condition can also be caused by their difficulty expressing symptoms of changes in mood, stress, or anxiety that are felt openly in their mother's environment. The period of labor experienced by the mother is difficult. During this time, the mother can accept the experience of giving birth which can give the impression of pressure or stress on the mother. Both can directly affect physiological processes, including nerves and hormones. The childbirth experience and the healing period after giving birth can trigger depression[29].

In this study, no respondents had a history of depression or a family of depression, so a chi-square relationship analysis could not be performed. The opinion of Dagher *et al*., 2021, it is coherently described that perinatal depression can occur and is related to depression, anxiety, lack of family support, and marital status[28]. In a study conducted by Keliyo, Jibril, and Wodajo in 2021, it was shown that pregnant women who have a history of psychological disorders have a higher chance of experiencing perinatal depression compared to pregnant women who do not have a history of psychological disorders[18]. During the perinatal period, the mother's body experiences emotional, psychological, and cognitive changes, which can be funded by changes in mood and decreased verbal function in the mother[10]. Support for the mother during the pregnancy process is not fulfilled, and the presence of psychological disorders causes perinatal depression and can affect the fetus being conceived[14].

CONCLUSION

A mother who has never given birth, a mother who has previously given birth normally or spontaneously, and mothers who do not have a history of complications, a history of depression, or a history of heredity are some of the most common characteristics of perinatal depression. It can also occur in mothers who do not have a history of complications, a history of depression, or a history of heredity.

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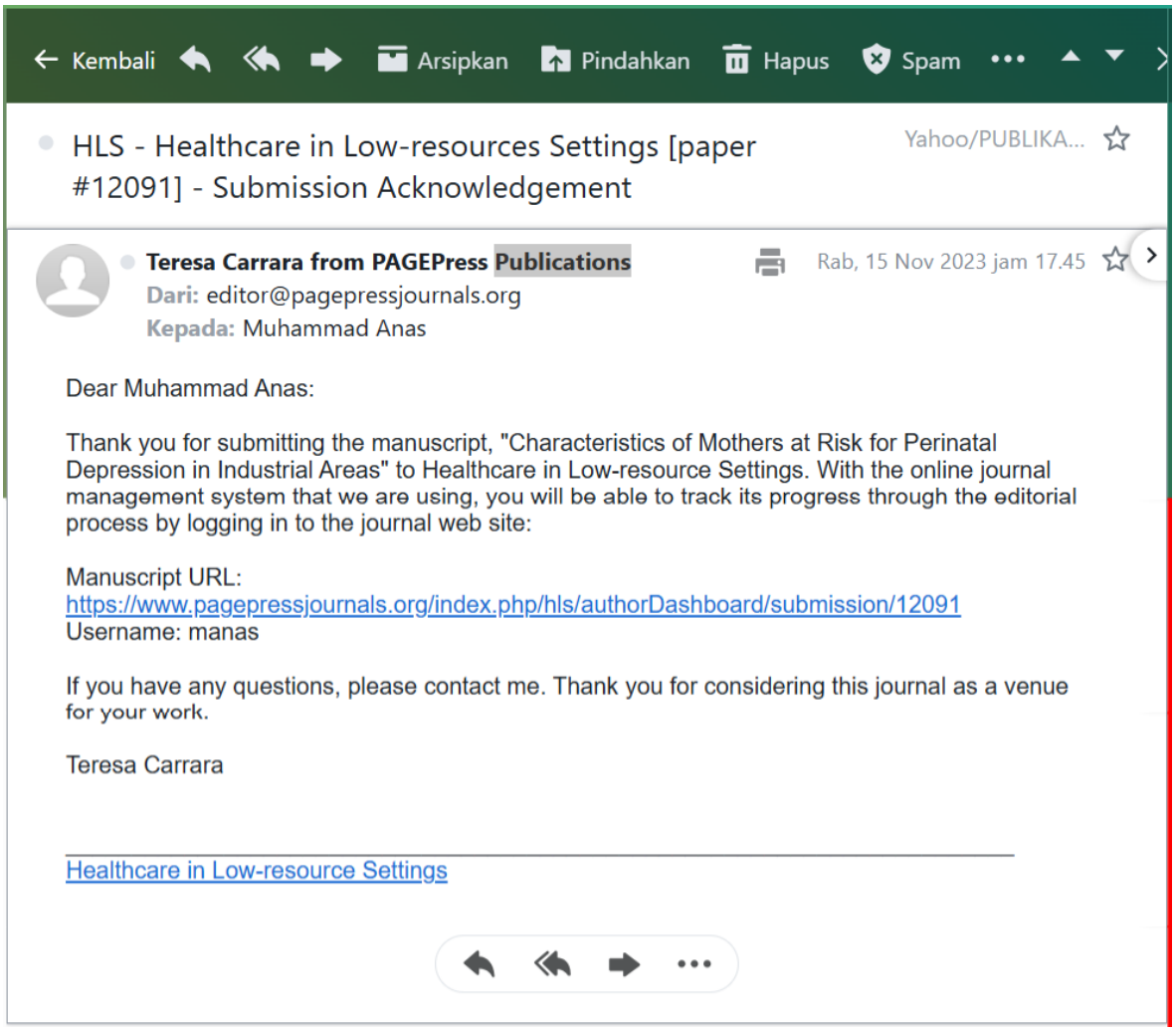

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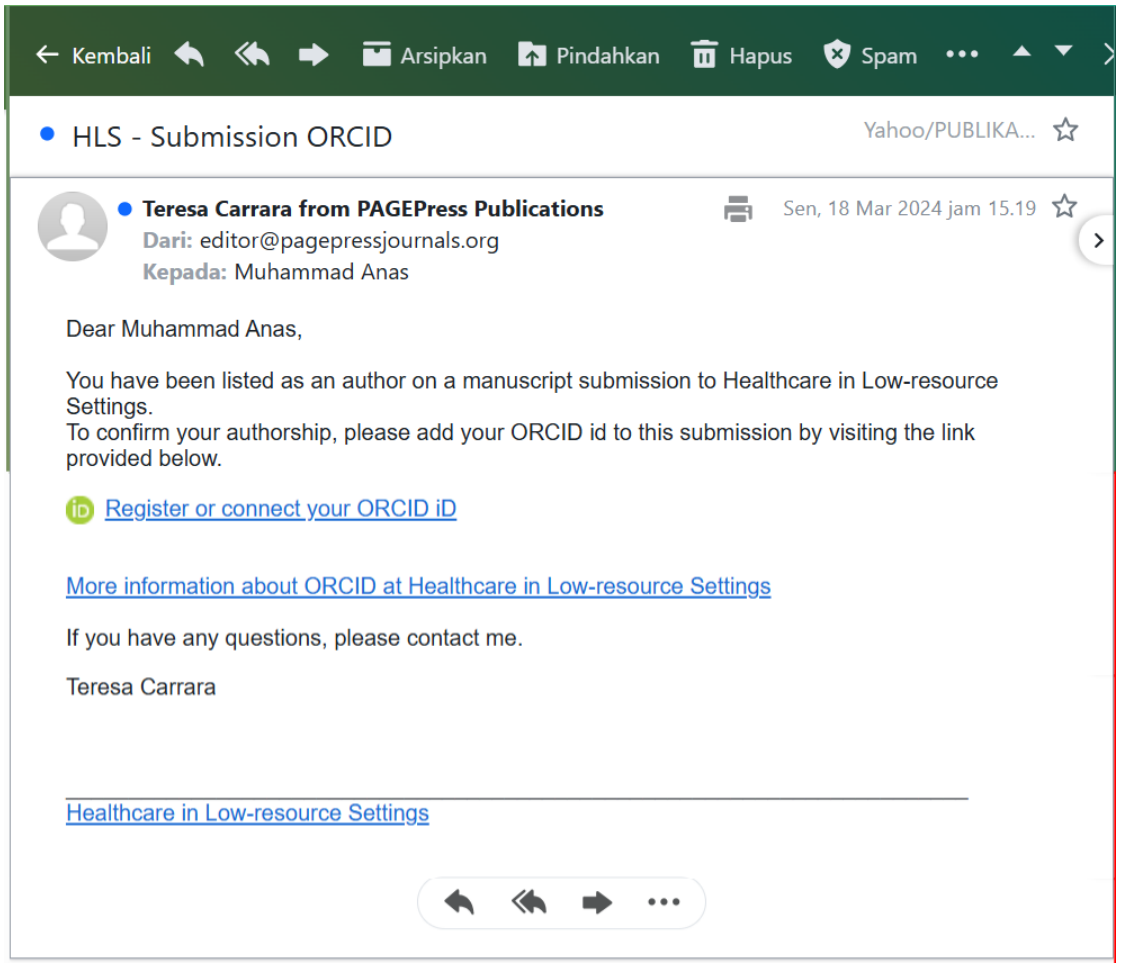

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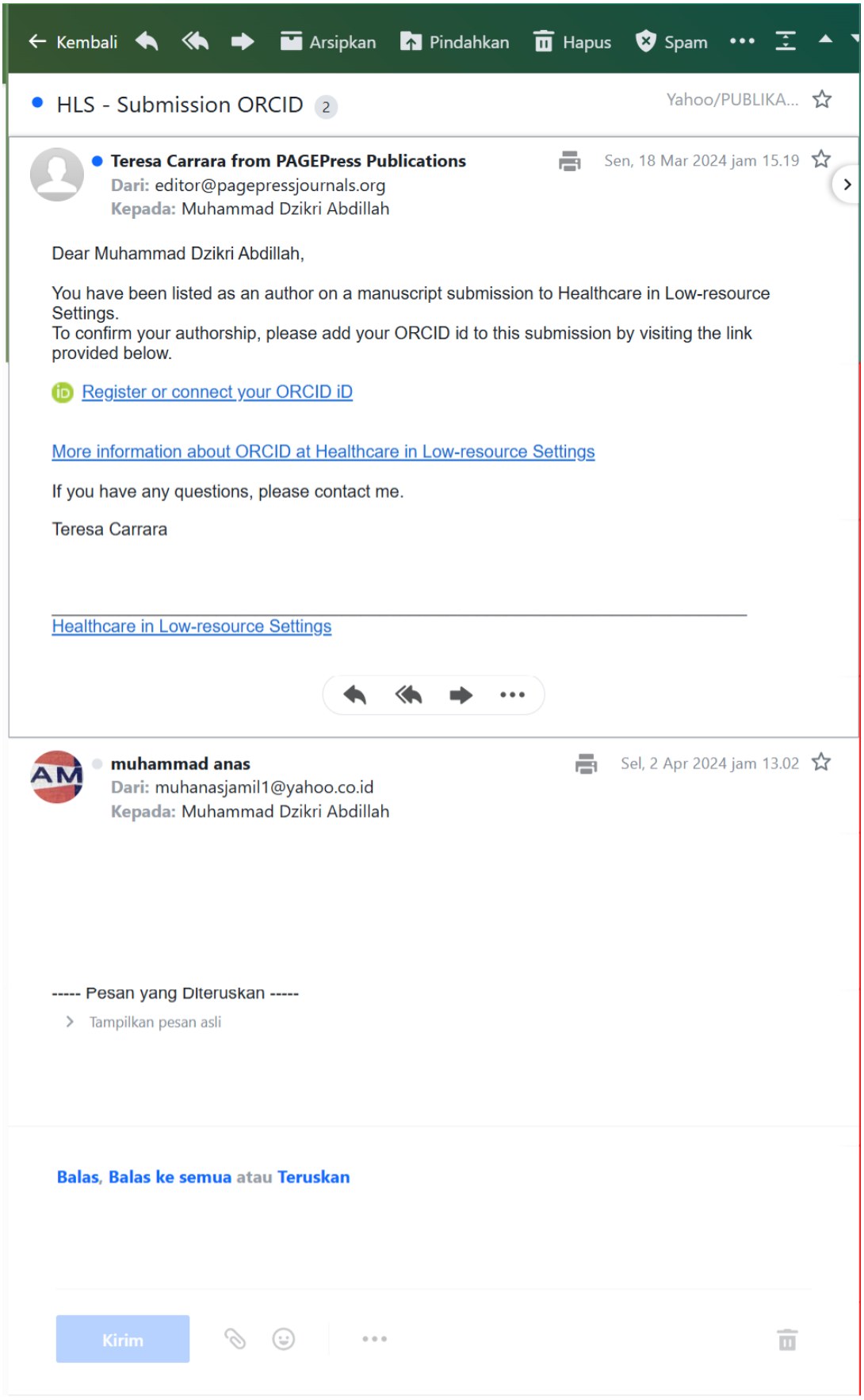
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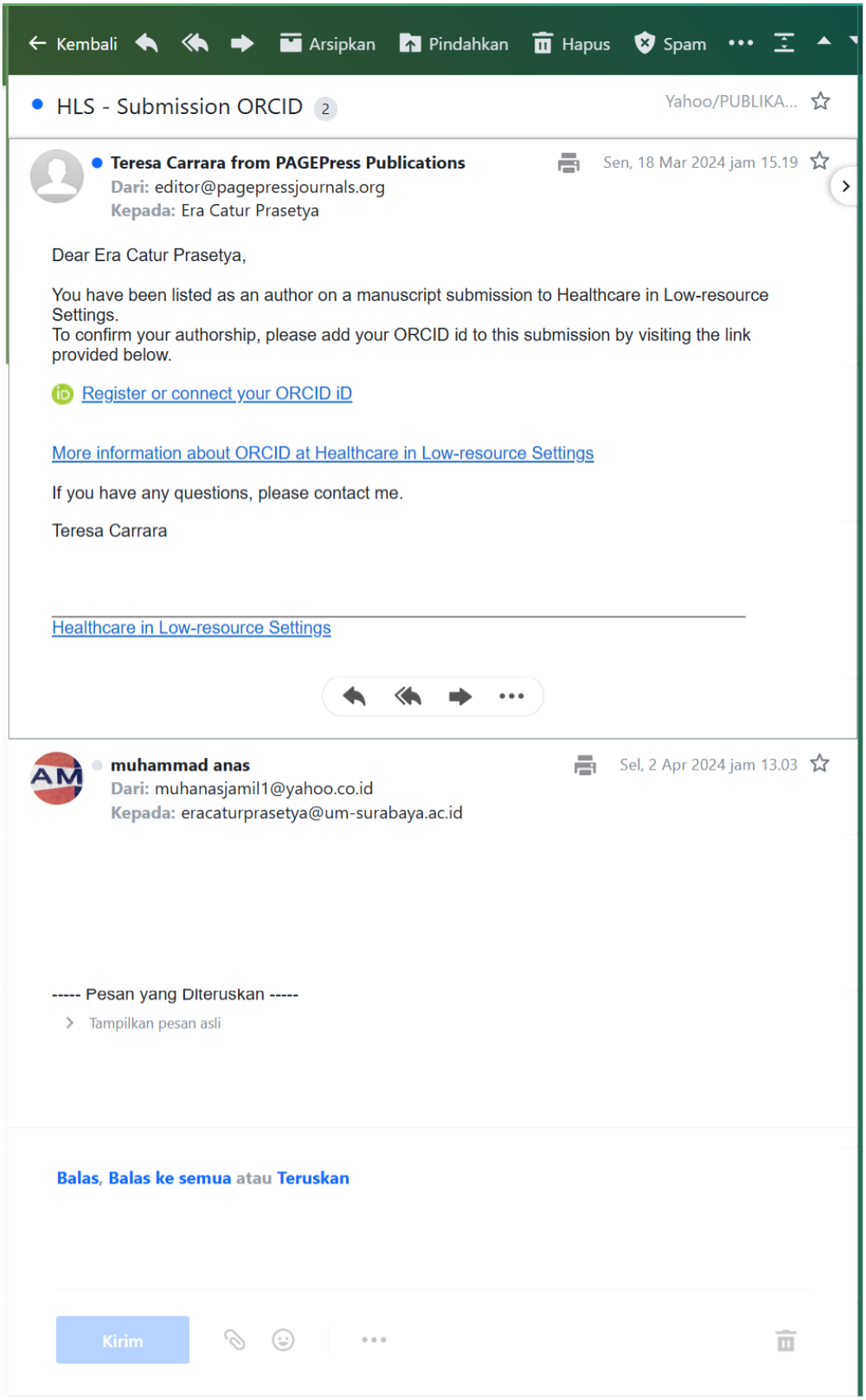
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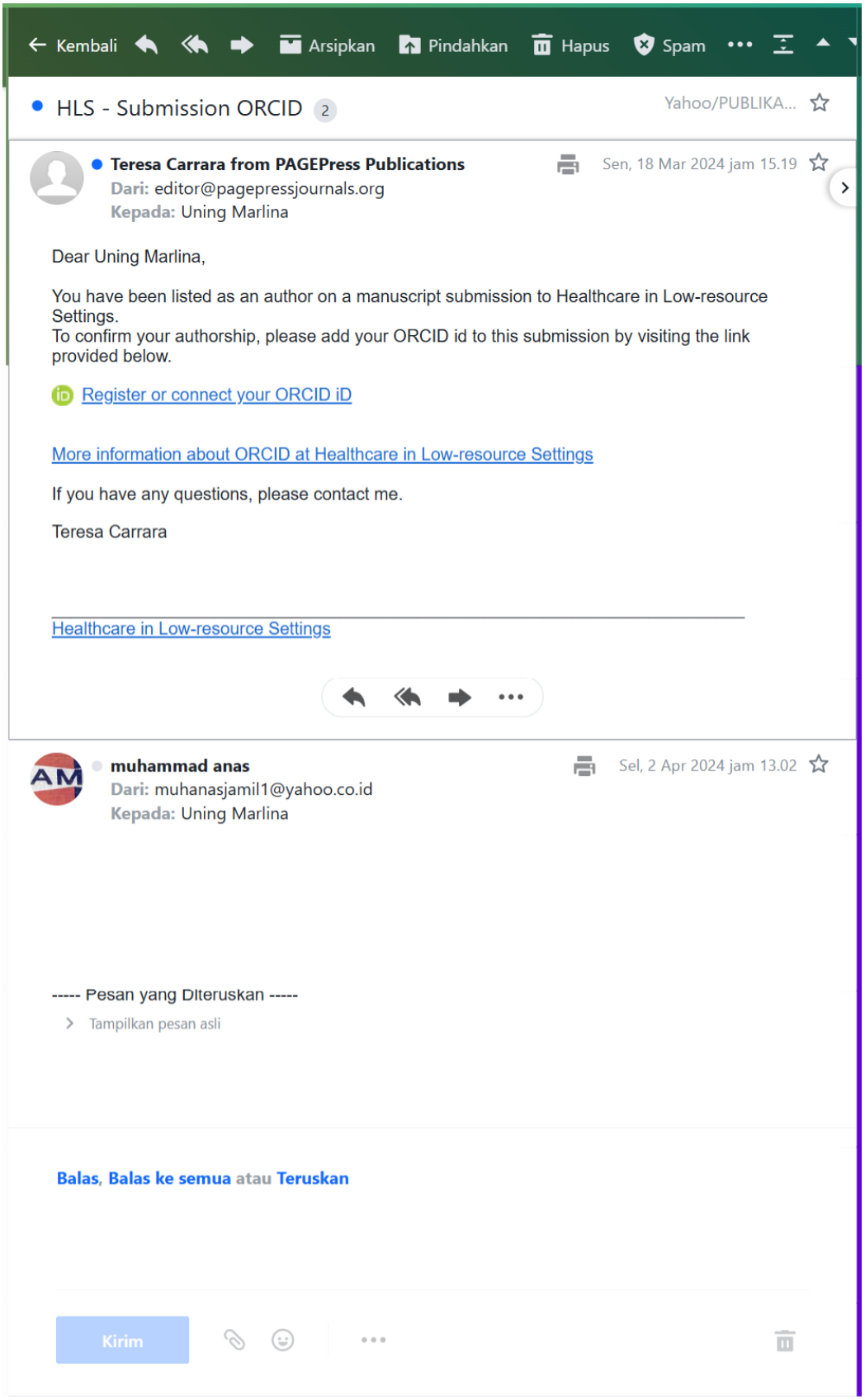
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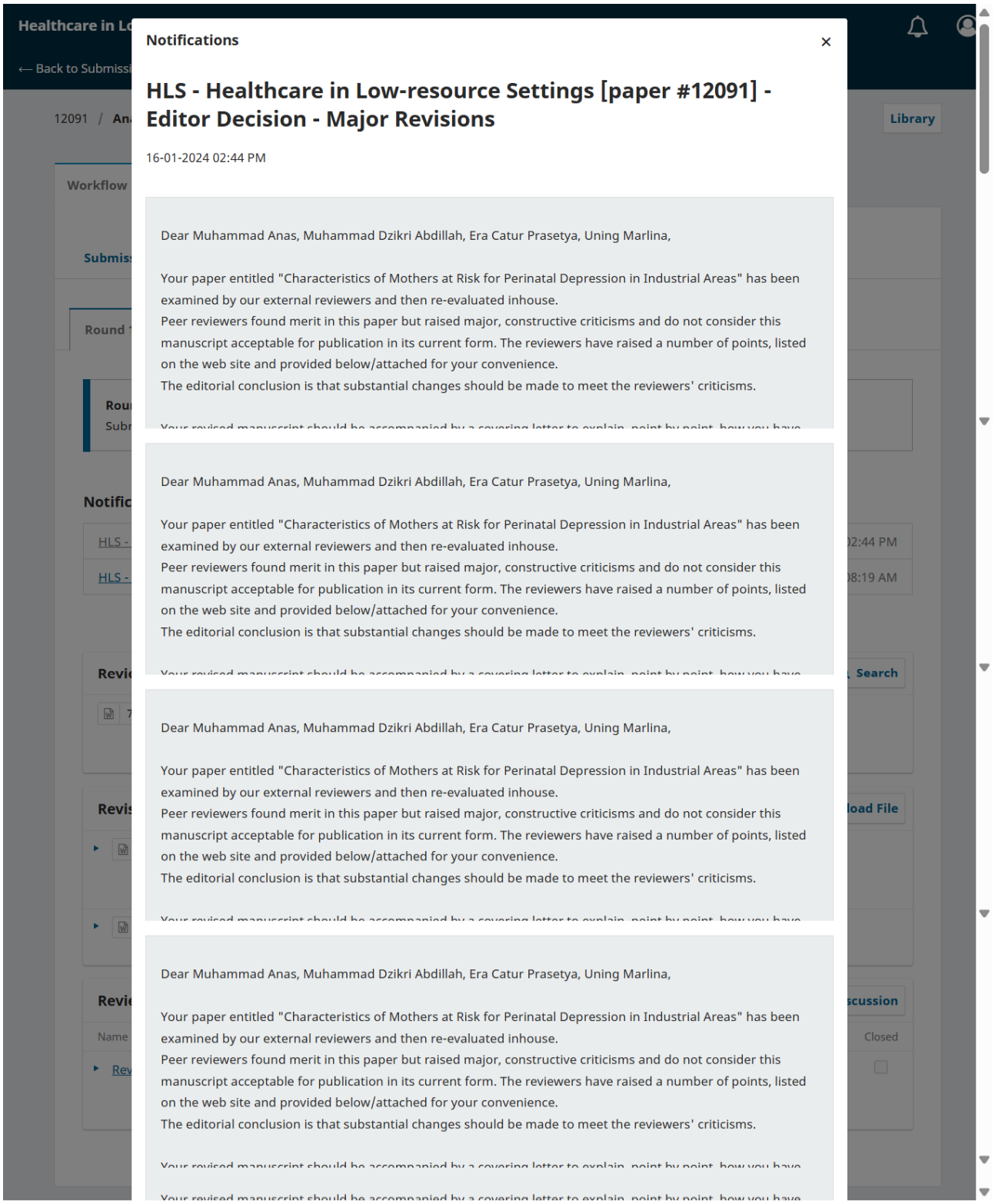
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Your paper entitled "Characteristics of Mothers at Risk for Perinatal Depression in Industrial Areas" has been examined by our external reviewers and then re-evaluated inhouse.
Peer reviewers found merit in this paper but raised major, constructive criticisms and do not consider this manuscript acceptable for publication in its current form. The reviewers have raised a number of points, listed on the web site and provided below/attached for your convenience.
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Characteristics of Mothers at Risk for Perinatal Depression in Industrial Areas

Muhammad Anas[2]*, Muhammad Dzikri Abdillah[1], Era Catur Prasetya[2], Uning Marlina[2]

[1]Student of Faculty of Medicine Universitas Muhammadiyah Surabaya, Surabaya, Indonesia

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Contributions:

This study was conducted and designed by MA, MDA, ECP, and UM. MDA, ECP, and UM performed sample collection. MA, MDA, ECP, and UM analyzed data and wrote the manuscripts. All authors read and approved the final manuscript.

Conflict of interest:

The authors declare no conflict of interest.

Ethics approval and consent to participate:

The research has received ethical approval from the Health Research Ethics Commission at the Universitas Muhammadiyah Surabaya. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence, and non-maleficence.

Patient consent for publication:

Written informed consent was obtained for anonymized patient information to be published in this article.

Funding:

This research did not receive external funding.

Availability of data and materials:

All data generated or analyzed during this study are included in this published article.

Acknowledgement:

We express our heartfelt gratitude to the Muhammadiyah Gresik Hospital for graciously offering to be the focal point of our research endeavors. Additionally, our sincere appreciation extends to our mentors, whose patient guidance has played a pivotal role in shaping the structure and effectiveness of this research. Their unwavering support has significantly contributed to the refinement and improvement of our work, and for this, we are truly thankful.

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.

Keywords: characteristics, industrial areas, mothers, perinatal depression, risks

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 Etude 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 percent 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 had adjusted the research criteria to contain 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

Data analysis in this study was carried out univariately to describe the characteristics of the respondents and continued with a bivariate test with the Spearman rank test 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.

Table 1 Distribution of respondents' characteristics

No	Characteristics		F	%
1	Religion	Islam	47	100,0
		Non-Islam	0	0
2	Ethnic	Javanese	40	85,1
		Sundanese	2	4,3
		Batak	0	0,0
		Madurese	3	6,4
		Banjar	0	0,0
		Bali	0	0,0
		Betawi	1	2,1
		Minangkabau	1	2,1
		Bugis	0	0,0
		Melayu	0	0,0
3	Age (years old)	<20	0	0,0
		20-35	40	85,1
		>35	7	14,9
4	Education	Basic education (Elementary to Senior High School)	31	66,0
		Further education (Diploma/Bachelor/ Master/Doctorate)	16	34,0
5	Job-status	Unemployed	26	55,3
		Employed	21	44,7
6	Family Income	Below Regional Minimum Wage (RMW)	16	34,0
		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	0,0
8	Last delivery	Never	23	48,9
		Normal	16	34,0
		Sectio Caesarea	8	17,0
9	Complication history	No	45	95,7
		Yes (Prolonged labor, postpartum bleeding)	2	4,3
10	Depression history	Noting	47	100,0
		Yes	0	0,0
11	Family Depression history	Noting	47	100,0
		Yes	0	0,0
12	Perinatal Depression Risk	Not depressed	19	40,4
		Possible depression	18	38,3
		The probability of depression is relatively high	8	17,0
		Depression is very likely	2	4,3

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 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						
	Yes (Prolonged labor, postpartum bleeding)	19 0	17 1	7 1	2 0	0,183	0,218
Last delivery	Never	6	11	5	1	-0,329	0,024*

Normal	6	7	2	1
Sectio Caesarea	7	0	1	0

Perinatal Depression Risk	<8=	Not depressed
	9-11=	Possible depression
	12-13=	The probability of depression is relatively high.
*=signifcant (p<0,05)	>=14=	Depression is very likely

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. 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 prevalence 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, 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 [34,38]. 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 [38]. 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 [38,39]. 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 [38]. 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 [40]. 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 [41].

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 [35,38]. 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 [42,43].

Research at RS Muhammadiyah Gresik revealed a significant negative correlation between prenatal childbirth, normal childbirth, and Sectio Cesaria (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 [41]. 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 [41]. Childbirth trauma can cause depression in mothers, affecting mood, stress, and anxiety during labor and postnatal healing [42]. 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 [44].

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 show 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 [38].

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. The incidence of prenatal depression risk was found to be linked with maternal age, work status, parity, and the latest delivery in this study.

CONCLUSION

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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Characteristics of Mothers at Risk for Perinatal Depression in Industrial Areas

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Dikomentari [Reviewer1]: Authors and affiliations?

Contributions:

This study was conducted and designed by MA, MDA, ECP and UM. MDA, ECP and UM performed sample collection. MA, MDA, ECP and UM analysed data and wrote the manuscripts. All authors read and approved the final manuscript.

Conflict of interest:

The authors declare no conflict of interest.

Ethics approval and consent to participate:

The research has received ethical approval from the Health Research Ethics Commission, the University of Muhammadiyah Surabaya During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence and non-maleficence.

Patient consent for publication:

Written informed consent was obtained for anonymized patient information to be published in this article.

Funding:

This research did not receive external funding

Availability of data and materials:

All data generated or analyzed during this study are included in this published article.

Akcnowledgement:

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Dikomentari [Reviewer2]: Acknowledgment

ABSTRACT

Background: A perinatal period is a change in expectant mothers prone to emotional changes such as depression during pregnancy. Specific depressive phenomena occur in 10-15% of women in the first year of childbirth. This condition harms the interaction between mother and child. This study aims to describe the characteristics of mothers with a risk of perinatal depression. This research was conducted at Muhammadiyah Gresik Hospital.

Method: The type of research used in this research is descriptive analytics. The sampling technique uses non-probability sampling with purposive sampling type. The research sample used was pregnant women with a gestational age of 20 weeks to 1 month after giving birth who were willing to become respondents. The exclusion criteria were pregnant women who experienced mental or psychological disorders and had a history of acute medical disorders.

Result: Of the 50 respondents, 30 (60.0%) were depressed. 50 (100.0%) were Muslim mothers, 43 (86.0%) came from Java, 2 (4.0%) came from Sundanese, 3 (6.0%) came from Madura, 1 (2.0) %) came from Berawi and 1 (2.0%) came from Minangkabau, 42 (84.0%) mothers were in the age range of 20-35 years, 8 (16.0%) were mothers over 35 years old, 33 (66 .0%) mothers with basic education (Elementary to Senior High School), 17 (34.0%) mothers with further education (Diploma/Bachelor/ master/ doctorate), 27 (54.0%) mothers with no work, 23 (46) .0%) working mothers, 17 (34.0%) families with an income below the minimum wage, 27 (54.0%) families with an income equal to the minimum wage, 6 (12.0%) families with income above the minimum wage, 25 (50.0%) mothers who have never given birth, 18 (36.0%) mothers with one delivery, 7 (14.0%) mothers who have given birth 2-5 times, 17 (34.0%) last normal delivery, 8 (16) the last .0%) delivered by cesarean section, 47 (94.0%) did not have labor complications, 3 (6.0%) had complications during delivery, no history of depression was found and family depression on respondents.

Dikomentari [Reviewer3]: -No need to write abstract into Introduction, Methods, Results, and Conclusion sections separately. Make it clear and concise in one parapgrah. Make sure the abstract is not more than 250 words.
-The grammar is a bit messed up. Please double-check the grammar to make proper sentences. Write properly with three parts of a sentence (Subject + Predicate + Object).

Conclusion: The most common characteristics of perinatal depression occur at the age of 20-35 years, have basic education, working mothers, have a family income below the UMR (low), mothers who have never given birth, mothers who previously gave birth normally or spontaneously, and can occur in mothers who do not have a history of complications and a history of depression and heredity.

Keywords: Perinatal depression, characteristics, risks, mothers, industrial areas

Dikomentari [Reviewer4]: Write in alphabetical order.

INTRODUCTION

The perinatal period is a transition for expectant mothers at risk of emotional changes such as depression during pregnancy. This phenomenon will be experienced by one of the seven expectant mothers who are associated with maternal and neonatal morbidity, which is influential if no action is taken intensively. Based on 2005 national data, 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 of birth [1,2]. In research on mental health, Munk-Olsen *et al*., 2006 and based on data obtained from the 2018 Riskesdas of the Indonesian Ministry of Health, it was found that depression often occurs in women of reproductive age [3,4].

Data obtained by Nasri, Wibowo, and Ghozali, 2017 found that the incidence of postpartum depression in Indonesia was lower than in other countries, such as in 1998–2001 in DKI Jakarta, Yogyakarta, and Surabaya, the incidence was found to be 11–30%[5]. Research conducted by O'Hara, M, W & Swain, A, 1996, found that women who gave birth to their first child experienced puerperal depression around 13% which occurred in the first year of the puerperium[6]. Other research shows that postpartum depression occurs in around 10–15% of women and is a health problem for women worldwide[7].

In the postpartum period, 85% of women experience psychological disorders, and 10-15% experience significant symptoms[8]. Specific depressive disorders occur in 10-15% of women in the first year after giving birth[1]. In 2007, Figueiredo, Pacheco, and Costa described a 25 percent risk of developing perinatal depression in adolescence. Young mothers are more prone to experiencing depression during pregnancy, but a study conducted by Eshbaugh in 2006 did not find the risk of perinatal depression in adolescents who were not at severe risk. In Indonesia, the incidence of postpartum depression is 11-30%[9]. This phenomenon is more severe than the

Dikomentari [Reviewer5]: In the introduction, please start by broadly introducing the topic, then provide general background information, narrowing to specific background research, and finally a focused research question or hypothesis (general to specific).

Please follow these following steps to revise:

-clarify each part of the paragraph because the form of the paragraph is not visible
-give more explanation about the reasons why you chose this topic and why it was so important to be discussed.
-demonstrate the relevance of a chosen topic and briefly review previous work on your chosen topic.
-involves identifying a gap, limitation, or shortcoming of previous research on your topic.
- fill the gap, limitation, or shortcoming you identified in the previous step. In an introduction, this will likely include your research question(s) or problem(s), hypotheses or objectives, and a brief overview of your rationale and methodologies.
- mention the aim of your study in the last paragraph.

Dikomentari [Reviewer6]: Please add more citations

Dikomentari [Reviewer7]: Add the citations please

baby blues and affects 1 in 10 new mothers. A person who has experienced depression has a 30% risk of postpartum depression[10].

Based on research by Bauman *et al*. in 2018, the prevalence of postpartum depression was reported to be an average of 13.2% and higher among American Indians/Native Alaskans (22.0%), Asian/Pacific Islanders (19.2%), and black women. (18.2%), while women with white skin (11.4%)[11]. This phenomenon will impact the social relationship between the mother and the baby, which will be disrupted, which will cause 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 give birth to premature babies and are at risk of having low and small final weights. This study aims to describe the characteristics of mothers with a risk of perinatal depression.

METHODS

Dikomentari [Reviewer8]: please revise by following these steps to explain in method:
1. Design
2. Population, sample, sampling
3. Variable
4. Instrument / intervention
5. Data collection process
6. Data Analysis
7. Ethical Clearance if there's any

Make it concise and clear in each subsection

This research was conducted in September 2022 at the obstetric outpatient polyclinic at Muhammadiyah Gresik Hospital. The method in this study used a descriptive-analytic approach to describe the characteristics of mothers with perinatal depression. The criteria for respondents in this study were pregnant women with a gestational age of 20 weeks to 1 month after giving birth and mothers who were 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.

Data was collected by distributing questionnaires to 47 respondents who had adjusted the research criteria to contain 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 %[5].

Data analysis in this study was carried out univariately to describe the characteristics of the respondents and continued with a bivariate test with the spearman rank test to determine the relationship between maternal profile and perinatal depression. The Health Research Ethics Committee at the University of Muhammadiyah Surabaya conducted the research ethics.

RESULTS

Table 1 Frequency Distribution of Research Respondents' Characteristics

No	Characteristics		F	%
1	Religion	Islam	47	100,0
		Non-Islam	0	0
2	Ethnic	Javanese	40	85,1
		Sundanese	2	4,3
		Batak	0	0,0
		Madurese	3	6,4
		Banjar	0	0,0
		Bali	0	0,0
		Betawi	1	2,1
		Minangkabau	1	2,1
		Bugis	0	0,0
		Melayu	0	0,0
3	Age (years old)	<20	0	0,0
		20-35	40	85,1
		>35	7	14,9
4	Education	Basic education (Elementary to Senior High School)	31	66,0
		Further education (Diploma/Bachelor/ Master/Doctorate)	16	34,0
5	Job-status	Unemployment	26	55,3
		Employment	21	44,7
6	Family Income	Below UMR	16	34,0
		equivalent UMR	25	53,2
		Above UMR	6	12,8
7	Parity (x times)	0	23	48,9
		1	17	36,2
		2-5	7	14,9
		>5	0	0,0
8	Last delivery	Never	23	48,9
		Normal	16	34,0
		Sectio Caesarea	8	17,0
9	Complication history	No	45	95,7
		Yes (Prolonged labor, postpartum bleeding)	2	4,3
10	Depression history	Noting	47	100,0
		Yes	0	0,0
11	Family Depression history	Noting	47	100,0
		Yes	0	0,0
12	Perinatal Depression Risk	Not depressed	19	40,4
		Possible depression	18	38,3
		The probability of depression is relatively high	8	17,0
		Depression is very likely	2	4,3

Dikomentari [Reviewer9]: -Please double-check the grammar in this section. Write in proper English.
-Please include a closing paragraph that clearly summarizes the key findings of the study.
-Begin with an introduction (before Table 1) to connect the results with the research question(s) to focus back to the purpose of the study after reading the literature review and methods sections of your paper.

Dikomentari [Reviewer10]: Please mention Table 1 in the text

Dikomentari [Reviewer11]: "Table 1. Frequency Distribution of Research Respondents' Characteristics"

Dikomentari [Reviewer12]: What is UMR? Give a note for the abbreviation and make sure that it's in English.

The results of the description of religious characteristics were obtained by 47 people who are Muslim. The description of ethnic characteristics was obtained by 40 Javanese, 2 Sundanese, 3 Madurese, 1 Betawi, and 1 Minangkabau. A description of the characteristics of the vulnerable age of 20-35 years was obtained from 40 people and seven people aged >35 years. Most (31 people) have mothers with basic education, and 16 people continue their further education (Diploma/Bachelor/Master/Doctorate). Based on the characteristics of the mother's work, it was found that 26 people did not work, and 21 people worked. Most families had the same income as UMR (25 people), 16 people were below UMR, and six were above UMR.

Based on the description of parity characteristics, it was found that 23 people were first pregnancies (0 times), 17 people had given birth once, and seven people had given birth 2-5 times. The results of the description of the characteristics of the last birth were obtained by 23 people who had never given birth, the last 16 people who gave birth normally, and the last eight people who gave birth by cesarean section. Most (45 people) had no history of complications, and 2 had complications in previous deliveries. In this study, no respondents had a history of depression or a family of depression.

Table 2 shows the results of the spearman rank test analysis of the relationship between characteristics and perinatal depression

Characteristics		Perinatal Depression Risk				Correlation coefficient (r)	p
		<8	9-11	12-13	>=14		
Age (years old)	<20	0	0	0	0		
	20-35	13	18	7	2	-0,314	0,032*
	≥ 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 UMR	3	8	4	1		
	equivalent UMR	14	8	2	1	-0,210	0,157
	Above UMR	2	2	2	0		
Parity (x times)	0	4	12	6	1	-0,410	0,004*
	1	11	3	2	1		

Dikomentari [Reviewer13]: Please give a name to this table.
Example:
"Table 2. Frequency Distribution of Research Respondents' Characteristics".

Dikomentari [Reviewer14]: What is p?

	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		
	Never	6	11	5	1		
Last delivery	Normal	6	7	2	1	-0,329	0,024*
	Sectio Caesarea	7	0	1	0		

Perinatal Depression Risk	<8=	Not depressed
	9-11=	Possible depression
	12-13=	The probability of depression is relatively high
*=signifcant (p<0,05)	>=14=	Depression is very likely

Table 2 shows Spearman's rank test analysis results, variable education level r=-0.234 p=0.100, family income r=-.0210 p=0.157, history of complications r=0.183 p=0.218. The three variables had a significance level of p>0.05, which did not mean that there was a relationship between education level, family income, and history of complications with the risk of perinatal depression.

Table 2 shows the analysis of Spearman's rank test variable maternal age r=-0.314 p=0.032*, employment status r=0.346 p=0.016*, parity r=-0.410 p=0.004*, and last delivery r=-0.329 p=0.024 *. The four variables have a significance level of p <0.05 which means that there is a significant relationship between maternal age, employment status, parity, and last birth with the risk of perinatal depression.

The correlation coefficient values obtained were -0.314, -0.410, and -0.329 belonging to the "moderate relationship" category because they are in the correlation level between 0.26-0.50. The value of the correlation coefficient was negative for maternal age, parity, and delivery variables, meaning that if the values of these three variables increase, the risk of experiencing perinatal depression decreases. Meanwhile, the correlation coefficient value was found to be positive for the employment status variable, which means that if the value of this variable increases, the risk of experiencing perinatal depression also increases.

DISCUSSION

This study shows a relationship between maternal age and the risk of perinatal depression in pregnant women at Muhammadiyah Gresik Hospital. This study also found that mothers who have a very high probability of depression in almost all mothers aged 20-35 years and very few mothers over the age of 35 have a very high probability of depression score, while depression is very likely to occur in all mothers aged 20- 35 years old. This research is in line with data found by Riskesdas of the Indonesian Ministry of Health (2018), which found that depression predominated in women of childbearing age[4]. Similar findings were also made in a study by Denckla *et al*. (2018). The incidence of depression was found more in mothers under the age of 23 compared to their peers who were not pregnant[12]. This condition can be caused by younger pregnant women who lack the health knowledge needed during pregnancy.

Another finding by Nicolet *et al*. found a high incidence of perinatal depression in young mothers and young pregnancies[7]. The findings also align with Li *et al*. in 2020 to analyze the correlation between maternal age and depression, and both have a significant effect[13]. This condition triggers depression because the mother will experience transitional changes from adolescence to adulthood and can be caused by a lack of experience regarding preparation for pregnancy[14]. This incident can occur because pregnant women at a young age are not medically and mentally ready to deal with hormonal changes during the perinatal period, so the risk of this pregnancy will be more at risk of experiencing perinatal depression. In contrast to the findings made by Mwita *et al*. (2021), the incidence of perinatal depression can occur at any age of the mother[15]. The incidence of depression in the elderly is at lower risk because increasing maternal age will increase emotional and psychological maturity so that parents can know the role and form patterns of good maternal behavior[9,12].

Dikomentari [Reviewer15]: The discussion section was too long, yet lack of references. Please shorten this section. It also needed to double-check the grammar. Please paraphrase it and make it concise and clear.
Please give more previous studies related to your topic and compare it with your study.

The discussion is a section in which an author describes, analyzes, and interprets their findings/results. Please revise by following this step:

- First, summarize the key findings from the research and link them to the initial research question. Seek to answer this question: What should readers take away from this paper?
- Second, place the findings in context. This step will involve going back to the literature review section and analyzing how the results fit in with previous research.
- Third, mention and discuss any unexpected results. Describe the results and reasonably interpret why they may have appeared. Additionally, if an unexpected result is significant to the research question, explain that connection.
- Fourth, address limitations or weaknesses in the research. Addressing limitations helps build your credibility as a writer because the reader sees that you have thought critically about what your study does and does not cover.
- Fifth, provide a brief look at potential follow-up research studies. Recommend a few areas where further investigation may be crucial. However, please don't go overboard with the suggestions, as they can leave a reader thinking more about the gaps in the paper rather than the actual findings.
- Sixth (and finally), restate the most significant findings and their implications. Please explain why the research is essential and remind readers of its connections to outside material, such as existing literature or an aspect of the field that is affected by the study.

During pregnancy, a maturation crisis occurs, which can be found in the reflection phase, weakening mental defense mechanisms, self-image transformation, and potential conflict with femininity. Age can be a trigger factor for depression during pregnancy. Especially for mothers who have a younger age, it will be a predictor of distress that occurs in the middle of pregnancy. At an early age, becoming a parent can cause obstacles during the transition from adolescence to adulthood and impact the emotional stability of each individual[14,16]. Depression can be interpreted as a psychological disorder with findings such as depression, anhedonia, decreased body weight, decreased interest, brooding, insomnia, and no appetite or concentration, and it can also be found as feeling like ending one's life[1].

In this study, it was found that most of the productive age had depression scores during pregnancy. This finding is in line with research by Lie *et al*., 2020; most productive ages experience depression during pregnancy[13]. Younger ages have a higher risk of experiencing depressive symptoms during pregnancy to postpartum because, at a young age, there is a process of transition from adolescence to adulthood accompanied by a lack of experience in a new role[12,14]. However, symptoms of depression during pregnancy can also be found at the age of over 30 years. This finding is in line with an analysis by Bjelica *et al*, who found that over 30 years of age experienced perinatal depression but had a low incidence rate[14]. As the mother ages, she will experience an increase in mental and emotional maturation so that she can understand her role as a parent and will form more efficient patterns of maternal behavior[9,12]. The test results above obtained a significant relationship between education level and perinatal depressive symptoms. This study follows the findings analyzed by Fatmawati and Mukoirotin found that low education has a significant relationship to symptoms of perinatal depression[17]. Another study by Keliyo *et al*, also found similar things with a low educational background at a high risk of experiencing depression[18,19].

Based on the results of this study, it was found that almost all of the respondents with basic education had a high probability of perinatal depression and perinatal depression was very likely to occur, while very few perinatal depression might occur in mothers who had an advanced educational background. In this study, it can be found that there is no relationship between the mother's education level and the risk of perinatal depression. This study agrees with the conclusions looked at by Li *et al*, Maternal education level and the likelihood that pregnant women experience perinatal depression did not correlate[20]. This condition may be brought on by the mother's high quality of environment and readiness during pregnancy.

Similar findings in Keliyo and Wodajo's research in 2021 revealed that mothers with low education had a higher risk of experiencing perinatal depression than mothers with higher education[18]. Pregnancy at a young age can interrupt mothers' schooling, so efforts to explore knowledge and information related to preparation for pregnancy and psychological preparation for childbirth are minimal for pregnant women. Mothers with higher education will easily understand reproductive health information so that they can reduce stress during pregnancy. In contrast, the results found in Juwitasari and Marni's research in 2020 obtained a negative correlation coefficient value which means that the higher the knowledge possessed by pregnant women, the lower the risk of experiencing perinatal depression[21]. This condition can be due to mothers with extensive knowledge of dealing with problems and preparations needed during pregnancy.

Education influences the psychological aspects and insights of a mother undergoing pregnancy. The lower the level of education, the more vulnerable to experiencing perinatal depression[18]. Education and insight will lead to a more prepared attitude towards risk events during pregnancy. Depressive events during pregnancy occur because the mother has not received adequate education or insight, so the mother is not ready during the pregnancy process[21,22]. High knowledge and education can be a preparedness or preventive measure in the incidence

of depression during pregnancy and become a protective trait for the mother[15]. This study found that the probability of perinatal depression was relatively high in almost half of the pregnant women who did not work and that most working mothers had a high probability of experiencing perinatal depression. In contrast, half of the pregnant women might experience perinatal depression in mothers who did not work and workers. The analysis of this study found a relationship between the mother's employment status and the risk of perinatal depression.

This research is in line with the findings conducted by Mwita *et al*., to find that the mother's employment status can affect the incidence of perinatal depression, and the risk is higher for working mothers than for homemakers[15]. This condition can cause mothers to have to prepare more physically to return to work and care for the children they contain. Similar studies have shown a relationship between a mother's work and the incidence of postpartum depression found in a study conducted by Kusuma in 2017[23]. This condition is related to the readiness that mothers have from the beginning of giving birth to facing the postpartum period, starting to worry during childbirth, and continuing to protect themselves and their babies until postpartum regarding baby care and how to breastfeed. Physical fatigue from caring for the baby all day after giving birth can trigger symptoms of depression.

A woman's psychological preparation for her new role as a mother is often associated with pregnancy and childbirth. Working mothers can trigger depressive phenomena during pregnancy which can cause mothers to experience ongoing fatigue while caring for their babies. This condition can cause the mother to experience pressure to meet the baby's needs, thus stressing the mother. During pregnancy, the needs of each individual also increase and will burden the mother[1,6]. This study found that the mother's employment status variable influenced the incidence of depression during pregnancy. This condition can be related to the physical aspect of the mother, who requires physical preparation to return to work after giving birth, and

is related to the mother's readiness from the beginning of the birth process until facing the postpartum period[23,24].

Based on the results of this study, the possibility of perinatal depression is relatively high in half of those with income below the UMR and very few in families whose income is equivalent to the UMR and above the UMR. In contrast, perinatal depression is likely to occur in families with incomes below the UMR and equivalent to the UMR. The results of this study did not show a relationship between family income and the risk of perinatal depression. They obtained a negative correlation coefficient which means that the higher the family income, the lower the risk of experiencing perinatal depression in pregnant women. Research conducted by Denckla *et al*..in 2018 revealed that middle to lower socioeconomic status is a risk factor for perinatal to postpartum depression[12]. The same thing was found in research that revealed low economics was related to and influenced the incidence of postpartum blues[25,26].

Dikomentari [Reviewer16]: What is UMR? Also, please make sure that it's an English abbreviation.

This study differs from the findings of Khanam *et al*., 2022, which found that perinatal depression was more common in families with middle to high incomes than families with low incomes. This study also found that the risk of depression during pregnancy was higher in families with high incomes[8]. In the findings of Fatmawati and Mukhoirotin., 2017 at the Puskesmas in the working area of the Peterongan sub-district, it was found that economic factors had a significant effect on perinatal depression[17,27]. In conditions of low economic status, it will cause more social pressure or stress, making it a mental burden for every individual, including mothers undergoing an ongoing pregnancy.

The unstable condition of the economic wheel disrupts aspects of the social and physical life, which causes difficulties in dealing with problems due to economic pressures in that individual's life. Economic pressure is also used as a reference for subjective feelings of pressure or suffering associated with views of the insufficiency of financial resources to meet

family needs[17]. Low family economic income can cause life pressure (stress) in the household, and the condition of the mother during pregnancy experiences significant changes, so both of them can cause depression during pregnancy to postpartum. This finding is in line with what was found in a study by Dagher *et al*., 2021, which revealed stress factors or life pressures to be a cause of perinatal depression[28]. Marriage and pregnancy increase the needs of each individual, which causes burden and triggers depression.

Family income has a significant value of $p < 0.05$ which significantly affects perinatal depression. The same thing is found in low economic relations and can affect the incidence of postpartum blues[25]. Under conditions of low-income families, it will cause pressure (stress) in the household, and when the mother during pregnancy experiences significant hormonal changes, both cause depression during pregnancy to postpartum[1,10]. This study found that the possibility of perinatal depression was relatively high in some pregnant women who had never given birth (0 times) and very few in primiparous women. In comparison, perinatal depression was likely to occur in half of the pregnant women who had never given birth (0 times) and primiparous women. This study found a relationship between parity and the risk of perinatal depression. The value of the correlation coefficient shows a negative result which means that the more birth experiences experienced by the mother, the lower the risk of perinatal depression.

The same findings can be found in Keliyo and Wodajo's research in 2021, where mothers with less experience of childbirth have a higher risk than mothers who have given birth or have had more experience of giving birth[18]. This condition happens because primigravida mothers do not know the necessary psychological preparations to prevent hormonal changes during pregnancy. Whereas to Khanam *et al*. 2022, mothers who have given birth experience an increased risk of experiencing depression during pregnancy[8], this condition can be caused by trauma during the birth process that the mother experienced. During the delivery process, a

299 complex event can cause stress to the mother because, during the delivery process, it can leave
300 trauma that impacts subsequent pregnancy depression[12]. During pregnancy, significant
301 hormonal changes can cause mood swings in the mother. Lack of experience and readiness
302 during pregnancy can trigger perinatal depression in primigravida women[14,17].

303 Based on the results of this study, it was found that the possibility of perinatal depression was
304 relatively high in almost all pregnant women who did not have a history of previous
305 complications and very few in mothers who had complications. In contrast, perinatal
306 depression was very likely to occur in all pregnant women who did not have a history of birth
307 complications. This study shows that a history of birth complications is not associated with the
308 risk of perinatal depression. This study is in line with the findings studied by Li *et al*. 2020
309 showing results that there is no relationship between the incidence of perinatal depression and
310 high-risk pregnancies[13]. This condition can happen because the mother gets good social
311 support. This condition can come from a partner, sibling, or friends needed by the mother
312 during pregnancy.

313 In contrast to the findings by Khanam *et al*. 2022, it was shown that mothers who have given
314 birth would increase the incidence of depression during subsequent pregnancies[8]. Memories
315 can cause this condition during the birth process that the mother experienced. Labor and stress
316 have directly affected the outcome of pregnancy through physiological reactions involving the
317 nervous, endocrine, and immunological systems. When labor takes place, it can be a bad
318 experience for the mother, and recurrent depressive disorders can occur after giving birth, even
319 if the child is in good health[29,30].

320 Postpartum complications can trigger increased anxiety, depression, and thoughts of self-
321 destruction in mothers who experience mood disorders after delivery. This condition can be

caused by extreme fatigue during childbirth and pain from postpartum complications, even though the mother has to go through the process as responsible for caring for the baby[10].

This study found that the possibility of perinatal depression was relatively high in some pregnant women who had never given birth and very few in women who had given birth spontaneously or normally. In contrast, perinatal depression was likely to occur in half of the pregnant women who had never given birth and women who had given birth vaginally or spontaneously. This study also shows a moderate association between the last delivery and the risk of perinatal depression.

Findings similar to those of Keliyo and Wodajo in 2021 reveal that primigravida mothers who have never given birth have an eightfold risk of experiencing depression during pregnancy[18]. Primigravida mothers have not had mature experience, so they do not create good maternal attitudes during pregnancy. In contrast to the findings by Ariyanti and Ari in 2016, cesarean delivery had a 3.7 times greater risk of experiencing postpartum depression than mothers who delivered normally or spontaneously[25]. This condition is due to the physical trauma the mother receives during childbirth, which affects the mother's psychology. Mothers with cesarean deliveries take longer to heal, which can delay the mother from carrying out her new role as a mother figure, so mothers with cesarean deliveries are at risk of experiencing depression.

Another study by Tri and Rofingatul Mubasyiroh in 2020 found a relationship between the delivery method and the incidence of perinatal depression[5]. This opinion is in line with Ririn, Detty, and Dhesi in 2015, who revealed that mothers who give birth normally or spontaneously are at greater risk of experiencing postpartum depression than mothers who deliver by cesarean section[25]. During labor, it can leave trauma during the birthing process, which causes the mother to experience depression. This condition can also be caused by their difficulty expressing symptoms of changes in mood, stress, or anxiety that are felt openly in their mother's

environment. The period of labor experienced by the mother is difficult. During this time, the mother can accept the experience of giving birth which can give the impression of pressure or stress on the mother. Both can directly affect physiological processes, including nerves and hormones. The childbirth experience and the healing period after giving birth can trigger depression[29].

In this study, no respondents had a history of depression or a family of depression, so a chi-square relationship analysis could not be performed. The opinion of Dagher *et al*., 2021, it is coherently described that perinatal depression can occur and is related to depression, anxiety, lack of family support, and marital status[28]. In a study conducted by Keliyo, Jibril, and Wodajo in 2021, it was shown that pregnant women who have a history of psychological disorders have a higher chance of experiencing perinatal depression compared to pregnant women who do not have a history of psychological disorders[18]. During the perinatal period, the mother's body experiences emotional, psychological, and cognitive changes, which can be funded by changes in mood and decreased verbal function in the mother[10]. Support for the mother during the pregnancy process is not fulfilled, and the presence of psychological disorders causes perinatal depression and can affect the fetus being conceived[14].

CONCLUSION

A mother who has never given birth, a mother who has previously given birth normally or spontaneously, and mothers who do not have a history of complications, a history of depression, or a history of heredity are some of the most common characteristics of perinatal depression. It can also occur in mothers who do not have a history of complications, a history of depression, or a history of heredity.

REFERENCES

Dikomentari [Reviewer17]: Conclude by:
- discussing the practical implications of your findings, based on your results. How your research outcomes can be applied in a real-world context.
- Summarizing the key findings and the implications of your study. How your results might impact the current situation in general.
- Show the potential interventions or programs that could benefit from your study's results briefly, and then straightly focus on what kind of recommended strategy/implication is from the variables in this study.

It is perfect if you focus on what kind/strategy/implication of this study, based on your results.

Dikomentari [Reviewer18]: -Please double-check the guidelines to see the correct style of writing the references.
-Make sure the references are all the newest and the most updated, including the newest edition when it comes to book references.

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Characteristics of mothers at risk for perinatal depression in Industrial Areas

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Contributions:

This study was conducted and designed by MA, MDA, ECP, and UM. MDA, ECP, and UM performed sample collection. MA, MDA, ECP, and UM analyzed data and wrote the manuscripts. All authors read and approved the final manuscript.

Conflict of interest:

The authors declare no conflict of interest.

Ethics approval and consent to participate:

The research has received ethical approval from the Health Research Ethics Commission at the Universitas Muhammadiyah Surabaya. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence, and non-maleficence.

Patient consent for publication:

Written informed consent was obtained for anonymized patient information to be published in this article.

Funding:

This research did not receive external funding.

Availability of data and materials:

All data generated or analyzed during this study are included in this published article.

Acknowledgement:

Dikomentari [Reviewer1]: Acknowledgment

Dikomentari [MA2R1]: done

The Muhammadiyah Gresik Hospital, which is willing to serve as a research center, and the mentors who patiently guide this research so that it can be structured effectively and better deserve our sincere gratitude.

Abstract

Expectant moms who are susceptible to emotional shifts during pregnancy, such as depression, go through a perinatal phase. In the first year after giving birth, 10-15% of women experience specific depressive symptoms. This situation harms the mother-child relationship. The purpose is to characterize the traits of moms who may experience prenatal depression at Muhammadiyah Gresik Hospital. Using purposive sampling and Spearman's rank test analytics on pregnant women between 20 weeks 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% had perinatal depression risk. The characteristics were Muslim, Javanese, ages of mothers, educational level, employment of mothers, family wage, given birth, mode of delivery, complications during delivery, and history of depression. Maternal age (r=-0.314 p=0.032*), employment status (r=0.346 p=0.016*), parity (r=-0.410 p=0.004*), and latest delivery (r=-0.329 p=0.024*) show a substantial correlation with the likelihood of perinatal depression. Maternal age, parity, and delivery had a negative correlation, and employment status had a positive correlation. The result of this study can be used as screening tools to identify perinatal depression risk mothers. It also proposes a pregnancy and delivery counseling intervention program for expectant mothers and non-workers.

Keywords: characteristics, industrial areas, mothers, perinatal depression, risks

Dikomentari [Reviewer3]: -No need to write abstract into Introduction, Methods, Results, and Conclusion sections separately. Make it clear and concise in one parapgrah. Make sure the abstract is not more than 250 words.
-The grammar is a bit messed up. Please double-check the grammar to make proper sentences. Write properly with three parts of a sentence (Subject + Predicate + Object).

Dikomentari [MA4R3]: done

Dikomentari [Reviewer5]: Write in alphabetical order.

Dikomentari [MA6R5]: done

Introduction

Perinatal depression occurs a lot, even though the mother and her family have not fully realized it. The perinatal period is a transition for expectant mothers at risk of emotional changes such as depression during pregnancy (1,2). This phenomenon will be experienced by one of the seven expectant mothers who are associated with maternal and neonatal morbidity, which is influential if no action is taken intensively (3–5). 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 of birth (6,7). In the Etude du DÉveloppement des Nouveau-nés (EDEN) study in France, depressive symptoms were observed at 22.5% during pregnancy and 13.6% postnatal (8). In research on mental health, Munk-Olsen *et al*., based on data obtained from the 2018 Riskesdas of the Indonesian Ministry of Health, it was found that depression often occurs in women of reproductive age (9,10).

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% (11). Research conducted by O'Hara and Swain found that women who gave birth to their first child experienced puerperal depression around 13%, which occurred in the first year of the puerperium (12). Other research shows that postpartum depression occurs in around 10–15% of women and is a health problem for women worldwide (13).

In the postpartum period, 85% of women experience psychological disorders, and 10-15% experience significant symptoms (14). Specific depressive disorders occur in 10-15% of women in the first year after giving birth (6). Figueiredo, Pacheco, and Costa described a 25 percent risk of developing perinatal depression in adolescence (15). 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 (16). In

Dikomentari [Reviewer7]: In the introduction, please start by broadly introducing the topic, then provide general background information, narrowing to specific background research, and finally a focused research question or hypothesis (general to specific).

Please follow these following steps to revise:

-clarify each part of the paragraph because the form of the paragraph is not visible
-give more explanation about the reasons why you chose this topic and why it was so important to be discussed.
-demonstrate the relevance of a chosen topic and briefly review previous work on your chosen topic.
-involves identifying a gap, limitation, or shortcoming of previous research on your topic.
- fill the gap, limitation, or shortcoming you identified in the previous step. In an introduction, this will likely include your research question(s) or problem(s), hypotheses or objectives, and a brief overview of your rationale and methodologies.
- mention the aim of your study in the last paragraph.

Dikomentari [MA8R7]: done

Dikomentari [Reviewer9]: Please add more citations

Dikomentari [MA10R9]: done

Dikomentari [Reviewer11]: Add the citations please

Dikomentari [MA12R11]: done

Indonesia, the incidence of postpartum depression is 11-30% (17). 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 (18).

Based on research by Bauman *et al*. in 2018, the prevalence of postpartum depression was reported to be an average of 13.2% and higher among American Indians/Native Alaskans (22.0%), Asian/Pacific Islanders (19.2%), and black women. (18.2%), while women with white skin (11.4%)(19). This phenomenon will impact the social relationship between the mother and the baby, which will be disrupted, which will cause 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 give birth to premature babies and are at risk of having low and small final weights. This study aims to describe the characteristics of mothers with a 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.

Dikomentari [Reviewer13]: please revise by following these steps to explain in method:
1. Design
2. Population, sample, sampling
3. Variable
4. Instrument / intervention
5. Data collection process
6. Data Analysis
7. Ethical Clearance if there's any

Make it concise and clear in each subsection

Dikomentari [MA14R13]: done

Variable, instrument and data collection

Data was collected by distributing questionnaires that had adjusted the research criteria to contain 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 (11).

Data analysis

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

Ethical clearence

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.

Table 1 Distribution of respondents' characteristics

No	Characteristics		F	%
1	Religion	Islam	47	100,0
		Non-Islam	0	0
2	Ethnic	Javanese	40	85,1
		Sundanese	2	4,3
		Batak	0	0,0
		Madurese	3	6,4
		Banjar	0	0,0
		Bali	0	0,0
		Betawi	1	2,1
		Minangkabau	1	2,1
		Bugis	0	0,0
		Melayu	0	0,0
3	Age (years old)	<20	0	0,0
		20-35	40	85,1
		>35	7	14,9
4	Education	Basic education (Elementary to Senior High School)	31	66,0
		Further education (Diploma/Bachelor/ Master/Doctorate)	16	34,0
5	Job-status	Unemployment	26	55,3
		Employment	21	44,7
6	Family Income	Below Regional Minimum Wage (RMW)	16	34,0
		Equivalent 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	0,0
8	Last delivery	Never	23	48,9
		Normal	16	34,0
		Sectio Caesarea	8	17,0
9	Complication history	No	45	95,7
		Yes (Prolonged labor, postpartum bleeding)	2	4,3
10	Depression history	Noting	47	100,0
		Yes	0	0,0
11	Family Depression history	Noting	47	100,0
		Yes	0	0,0

Dikomentari [Reviewer15]: -Please double-check the grammar in this section. Write in proper English.
-Please include a closing paragraph that clearly summarizes the key findings of the study.
-Begin with an introduction (before Table 1) to connect the results with the research question(s) to focus back to the purpose of the study after reading the literature review and methods sections of your paper.

Dikomentari [MA16R15]: done

Dikomentari [Reviewer17]: Please mention Table 1 in the text

Dikomentari [MA18R17]: done

Dikomentari [Reviewer19]: "Table 1. Frequency Distribution of Research Respondents' Characteristics"

Dikomentari [MA20R19]: Done

Dikomentari [Reviewer21]: What is UMR? Give a note for the abbreviation and make sure that it's in English.

Dikomentari [MA22R21]: Done

12	Perinatal Depression Risk	Not depressed	19	40,4
		Possible depression	18	38,3
		The probability of depression is relatively high	8	17,0
		Depression is very likely	2	4,3

The study surveyed Muslim individuals, mainly Javanese, and found that 66% have basic education, 34% continue it, and 55.33% do not work. Most families had an RMW income, with 53.11% having income below RMW. The study found that 48.9% of participants were first pregnancies, and 36.2% had given birth once. The last birth characteristics were described by 23 people, 16 normal births, and eight cesarean sections. Most respondents had no history of complications or depression.

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		
	20-35	13	18	7	2	-0,314	0,032*
	≥ 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		
	equivalent RMW	14	8	2	1	-0,210	0,157
	Above RMW	2	2	2	0		
Parity (x times)	0	4	12	6	1		
	1	11	3	2	1	-0,410	0,004*
	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		
	Normal	6	7	2	1	-0,329	0,024*
	Sectio Caesarea	7	0	1	0		

Perinatal Depression Risk
<8= Not depressed
9-11= Possible depression
12-13= The probability of depression is relatively high.

Dikomentari [Reviewer23]: Please give a name to this table.
Example:
"Table 2. Frequency Distribution of Research Respondents' Characteristics".

Dikomentari [MA24R23]: Done

Dikomentari [Reviewer25]: What is p?

Dikomentari [MA26R25]: Done

*=signifcant (p<0,05) >=14= Depression is very likely

Table 2 shows Spearman's rank test analysis reveals that education level, family income, and history of complications did not appear to be related to prenatal depression risk. Spearman's rank test analysis reveals a significant correlation between maternal age, employment status, parity, and 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 increasing these variables reduces the risk of perinatal depression. The positive correlation coefficient value indicates that an increase in the employment status variable increases the 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 is in line with the results of Li H et al., which revealed that primary education mothers were more likely to experience perinatal depression, while continuing education mothers may experience less, but no correlation was found (23). The high-quality environment and readiness of the mother during pregnancy can contribute to this condition.

These results differ from previous studies from researchers such as Fatmawati and Mukoirotin that low education is associated with perinatal symptoms of depression (20). The study of Keliyo et al. revealed that individuals with low educational backgrounds are at higher risk of depression (21,22). Juwitasari and Marni received higher education, reducing stress during pregnancy, but the risk of perinatal depression decreased with higher knowledge (24). This condition can be attributed to mothers who have extensive knowledge about handling

Dikomentari [Reviewer27]: The discussion section was too long, yet lack of references. Please shorten this section. It also needed to double-check the grammar. Please paraphrase it and make it concise and clear.
Please give more previous studies related to your topic and compare it with your study.

The discussion is a section in which an author describes, analyzes, and interprets their findings/results. Please revise by following this step:

- First, summarize the key findings from the research and link them to the initial research question. Seek to answer this question: What should readers take away from this paper?
- Second, place the findings in context. This step will involve going back to the literature review section and analyzing how the results fit in with previous research.
- Third, mention and discuss any unexpected results. Describe the results and reasonably interpret why they may have appeared. Additionally, if an unexpected result is significant to the research question, explain that connection.
- Fourth, address limitations or weaknesses in the research. Addressing limitations helps build your credibility as a writer because the reader sees that you have thought critically about what your study does and does not cover.
- Fifth, provide a brief look at potential follow-up research studies. Recommend a few areas where further investigation may be crucial. However, please don't go overboard with the suggestions, as they can leave a reader thinking more about the gaps in the paper rather than the actual findings.
- Sixth (and finally), restate the most significant findings and their implications. Please explain why the research is essential and remind readers of its connections to outside material, such as existing literature or an aspect of the field that is affected by the study.

Dikomentari [MA28R27]: done

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 (24,25). Higher knowledge and education make it a protective trait for mothers (26).

A study at Muhammadiyah Gresik Hospital revealed that family income was 34% below RMW, 55.3% according to RMW, and 12.8% above RMW. It does not appear to be associated with significant prenatal depression risk with a negative correlation.

These results are different from some other researchers who reveal a relationship between perinatal depression and low income; some who get the results of high-income families are also affected by perinatal depression.

Research by Denckla et al. middle to lower socioeconomic status is a risk factor for perinatal to postpartum depression (27), low economic status is associated with and affects the prevalence of postpartum blues (28,29), as well as Fatmawati and Mukhoirotin at the Puskesmas Kecamatan Peterongan revealed that economic factors have a significant impact on perinatal depression (20,30). Low economic status can lead to increased social pressure and stress, causing a mental burden for individuals, including mothers undergoing pregnancy. The study of Dagher et al. at low family incomes and significant changes in pregnancy conditions can lead to life stresses and depression (31). 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 (6,18). Interestingly, the study of Khanam R, Applegate J, Nisar I, Dutta A, Rahman S, Nizar A, et al. got different results, revealing that perinatal depression is more prevalent in families with high incomes, especially in mothers who give birth with low birth weight babies (14).

Dikomentari [Reviewer29]: What is UMR? Also, please make sure that it's an English abbreviation.

Dikomentari [MA30R29]: Done

The study at Muhammadiyah Gresik Hospital reveals that a history of complications did not appear to be related to prenatal depression risk.

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 (32). During pregnancy, the mother's condition can be triggered by receiving sufficient social support from her partner, sibling, or friends.

Postpartum complications can lead to increased anxiety, depression, and self-destruction in mothers, exacerbated by extreme fatigue and pain during childbirth and postpartum care (18).

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 is in line with the Indonesian Ministry of Health's Riskesdas data, which reveals that depression mainly occurs in women of childbearing age (10). The study of Denckla et al. and Nicolet et al. found a high prevalence of perinatal depression in young mothers (13,27). Research by Lie et al. shows that most of the productive age experience depression during pregnancy (due to the transition from adolescence to adulthood (27,33). This condition triggers depression in mothers due to changes in the transition from adolescence to adulthood and lack of experience in preparation for pregnancy (33). 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 of mental defenses, transformation of self-image, and potential conflict with femininity. Age can trigger depression, especially in younger mothers. Parenting early can disrupt emotional stability and transition from adolescence to adulthood (33,34). Depression is a psychological disorder characterized by symptoms such as depression, anhedonia, weight loss, decreased interest, ruminating,

insomnia, and feelings of ending life (6). Studies by Bjelica et al., perinatal depression symptoms can be observed in individuals over 30 years of age with a low incidence rate (33). As a mother ages, she experiences mental and emotional maturation, increasing her understanding of parenthood and forming more efficient patterns of maternal behavior (17,27). 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 (26). Older people are at lower risk of depression as mothers age, which fosters emotional and psychological maturity, allowing parents to form good maternal behavior patterns (17,27).

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*., who found that maternal employment status can influence the incidence of perinatal depression, and the risk is higher for working mothers than housewives (26). Studies by Kusuma 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 (35). Mothers' readiness for postpartum care, worry, 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 (6,12). 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 readiness (35,36).

Research at RS Muhammadiyah Gresik revealed a significant negative correlation between parity less than 2 and 2 or more (85.1%, 14.9%) with the risk of prenatal depression.

Keliyo and Wodajo's research reveals that mothers with less childbirth experience have a higher risk compared to those with more experience (21). Khanam et al. that pregnancy-induced depression is more common in mothers who have not received psychological preparation (14). Birth trauma and complex events during childbirth can cause stress and depression, impacting the mother's subsequent pregnancy (27). Hormonal changes during pregnancy can cause mood swings in the mother, while lack of experience and readiness can trigger perinatal depression in primigravida women (20,33). 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 (37,38).

Research at RS Muhammadiyah Gresik revealed a significant negative correlation between prenatal childbirth, normal childbirth, and Sectio Cesaria (48.9%, 34.0%, 17.0%) with the risk of prenatal depression.

Similar findings with Keliyo and Wodajo revealed that primigravida mothers who had never given birth had an eightfold risk of developing depression during pregnancy (21). Primigravida mothers have no experience, which causes a bad maternal attitude during pregnancy. Cesarean delivery increases the risk of postpartum depression 3.7 times compared to spontaneous delivery (28). A study by Tri and Rofingatul Mubasyiroh found that perinatal depression can be caused by physical trauma during childbirth, especially cesarean delivery, which takes longer to heal (11). In contrast, Ririn, Detty, and Dhesi found that mothers who gave spontaneous birth were at higher risk of postpartum depression (28). Childbirth trauma can cause depression in mothers, affecting mood, stress, and anxiety during labor and postnatal

healing (37). Berry et al. The likelihood of perinatal depression is high in unborn pregnant women, while it is less in spontaneous birth (39).

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 opinions coherently illustrate that perinatal depression can occur and is associated with depression, anxiety, lack of family support, and marital status (31). Keliyo, Jibril, and Wodajo show that pregnant women who have a history of psychological disorders have a higher chance of experiencing perinatal depression (21). 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 (18). Support for the mother during pregnancy is not met, and the presence of psychological disorders causes perinatal depression and can affect the fetus being conceived (33).

The study's limitations include that it only included people who lived in industrial districts, which means it does 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. The incidence of prenatal depression risk was found to be linked with maternal age, work status, parity, and latest delivery in this study.

CONCLUSION

The study's findings indicate that there is no significant relationship between prenatal depression risk and family income, education level, or history of difficulties. The risk of prenatal depression is highly correlated with maternal age, employment status, parity, and recent delivery. Reduced frequency of perinatal depression risk is closely correlated with mothers who have given birth or who have given birth with prior surgery and maternal age in

Dikomentari [Reviewer31]: Conclude by:
- discussing the practical implications of your findings, based on your results. How your research outcomes can be applied in a real-world context.
- Summarizing the key findings and the implications of your study. How your results might impact the current situation in general.
- Show the potential interventions or programs that could benefit from your study's results briefly, and then straightly focus on what kind of recommended strategy/implication is from the variables in this study.

It is perfect if you focus on what kind/strategy/implication of this study, based on your results.

Dikomentari [MA32R31]: done

reproductive age. Simultaneously, perinatal depression risk is significantly elevated among women who do not work.

In particular, moms who have never given birth and who are pregnant at an age too young or too old can utilize the study's findings as a screening tool to determine the occurrence of perinatal depression risk. In addition, a pregnancy and delivery counseling intervention program is being developed to support expectant mothers in developing their knowledge and understanding. For mothers who do not work, a program of counseling and/or family assistance is designed for expectant mothers. Expectant and new mothers may be able to reduce their chance of developing postpartum depression in the future.

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Dikomentari [Reviewer33]: -Please double-check the guidelines to see the correct style of writing the references. -Make sure the references are all the newest and the most updated, including the newest edition when it comes to book references.

Dikomentari [MA34R33]: done

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Characteristics of Mothers at Risk for Perinatal Depression in Industrial Areas

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Contributions:

This study was conducted and designed by MA, MDA, ECP, and UM. MDA, ECP, and UM performed sample collection. MA, MDA, ECP, and UM analyzed data and wrote the manuscripts. All authors read and approved the final manuscript.

Conflict of interest:

The authors declare no conflict of interest.

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The research has received ethical approval from the Health Research Ethics Commission at the Universitas Muhammadiyah Surabaya. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence, and non-maleficence.

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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.

Keywords: characteristics, industrial areas, mothers, perinatal depression, risks

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 Etude 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 percent 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 had adjusted the research criteria to contain 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

Data analysis in this study was carried out univariately to describe the characteristics of the respondents and continued with a bivariate test with the Spearman rank test 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.

Table 1 Distribution of respondents' characteristics

No	Characteristics		F	%
1	Religion	Islam	47	100,0
		Non-Islam	0	0
2	Ethnic	Javanese	40	85,1
		Sundanese	2	4,3
		Batak	0	0,0
		Madurese	3	6,4
		Banjar	0	0,0
		Bali	0	0,0
		Betawi	1	2,1
		Minangkabau	1	2,1
		Bugis	0	0,0
		Melayu	0	0,0
3	Age (years old)	<20	0	0,0
		20-35	40	85,1
		>35	7	14,9
4	Education	Basic education (Elementary to Senior High School)	31	66,0
		Further education (Diploma/Bachelor/ Master/Doctorate)	16	34,0
5	Job-status	Unemployed	26	55,3
		Employed	21	44,7
6	Family Income	Below Regional Minimum Wage (RMW)	16	34,0
		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	0,0
8	Last delivery	Never	23	48,9
		Normal	16	34,0
		Sectio Caesarea	8	17,0
9	Complication history	No	45	95,7
		Yes (Prolonged labor, postpartum bleeding)	2	4,3
10	Depression history	Noting	47	100,0
		Yes	0	0,0
11	Family Depression history	Noting	47	100,0
		Yes	0	0,0
12	Perinatal Depression Risk	Not depressed	19	40,4
		Possible depression	18	38,3
		The probability of depression is relatively high	8	17,0
		Depression is very likely	2	4,3

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 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						
	Yes (Prolonged labor, postpartum bleeding)	19 0	17 1	7 1	2 0	0,183	0,218
Last delivery	Never	6	11	5	1	-0,329	0,024*

Normal	6	7	2	1
Sectio Caesarea	7	0	1	0

Perinatal Depression Risk	<8=	Not depressed
	9-11=	Possible depression
	12-13=	The probability of depression is relatively high.
*=signifcant (p<0,05)	>=14=	Depression is very likely

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. 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 prevalence 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, 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 [34,38]. 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 [38]. 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 [38,39]. 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 [38]. 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 [40]. 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 [41].

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 [35,38]. 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 [42,43].

Research at RS Muhammadiyah Gresik revealed a significant negative correlation between prenatal childbirth, normal childbirth, and Sectio Cesaria (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 [41]. 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 [41]. Childbirth trauma can cause depression in mothers, affecting mood, stress, and anxiety during labor and postnatal healing [42]. 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 [44].

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 show 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 [38].

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. The incidence of prenatal depression risk was found to be linked with maternal age, work status, parity, and the latest delivery in this study.

CONCLUSION

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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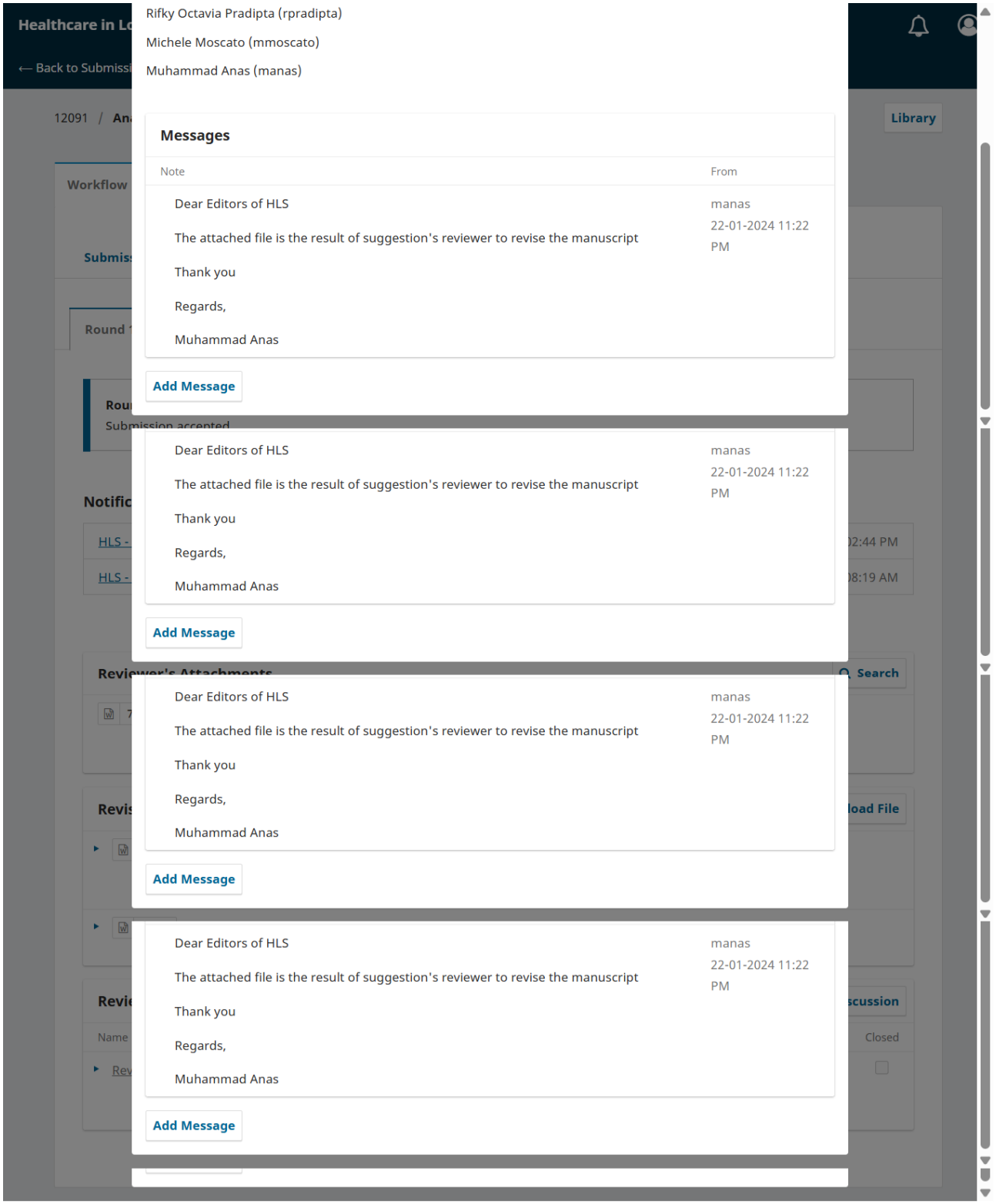
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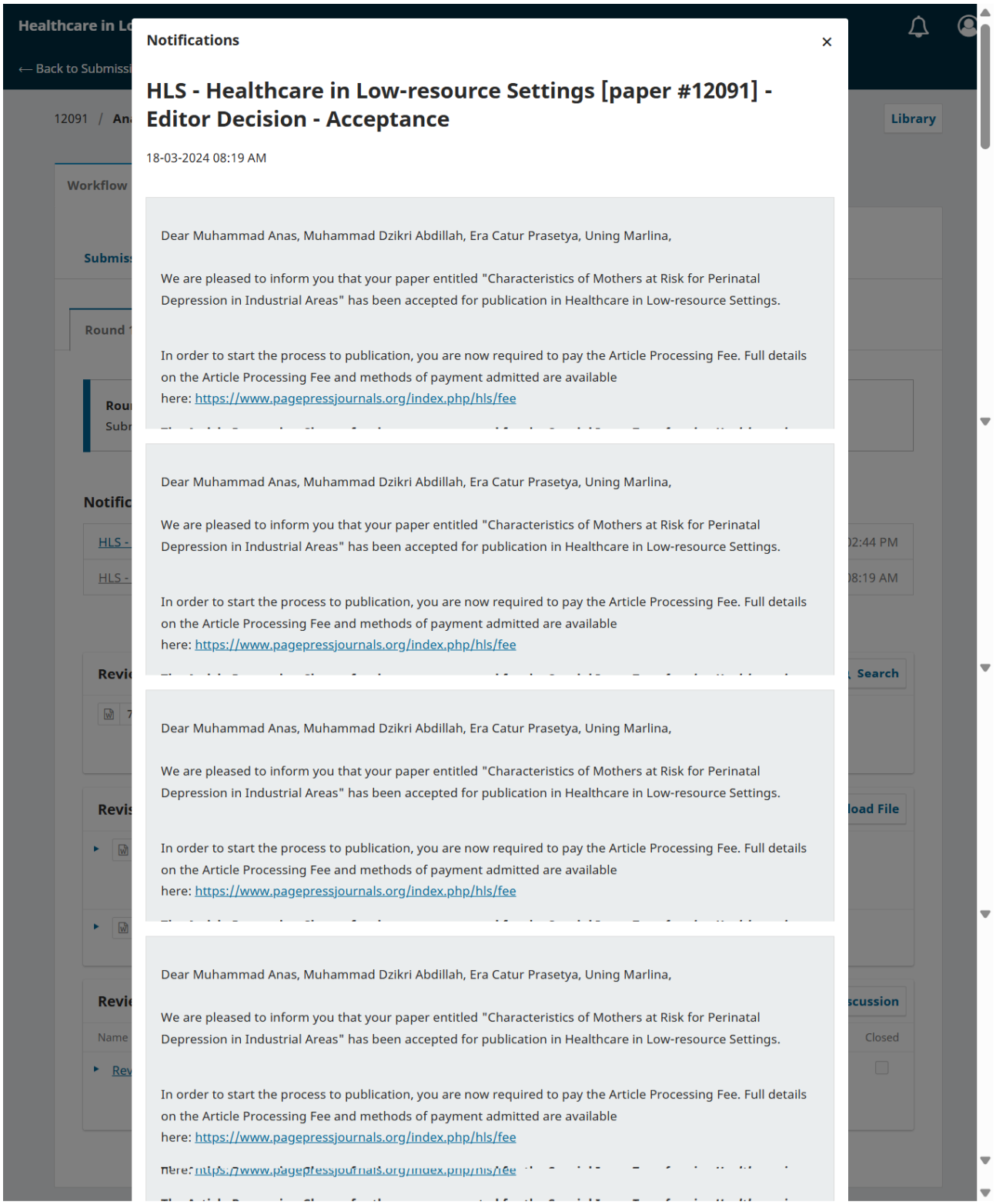

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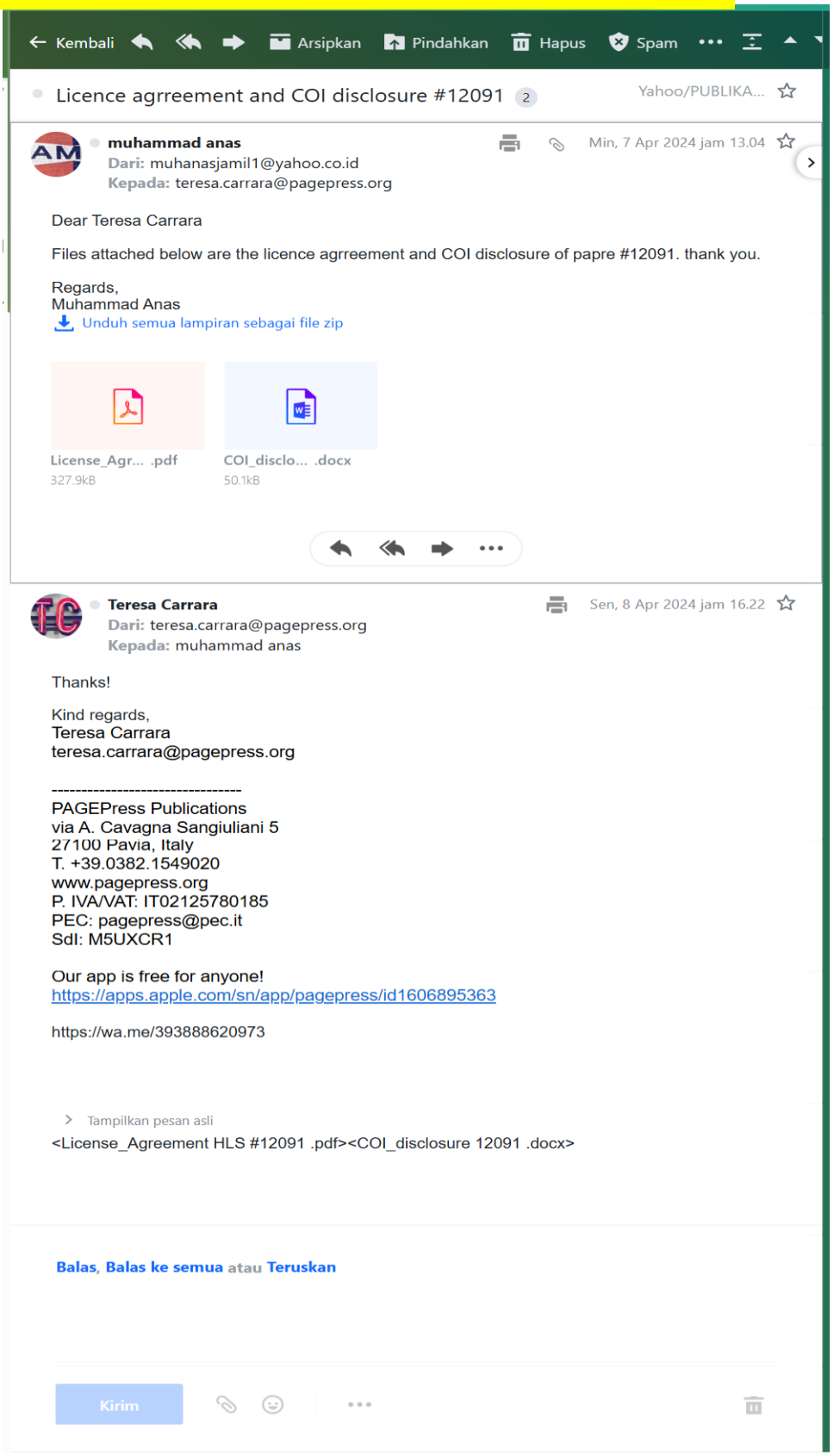

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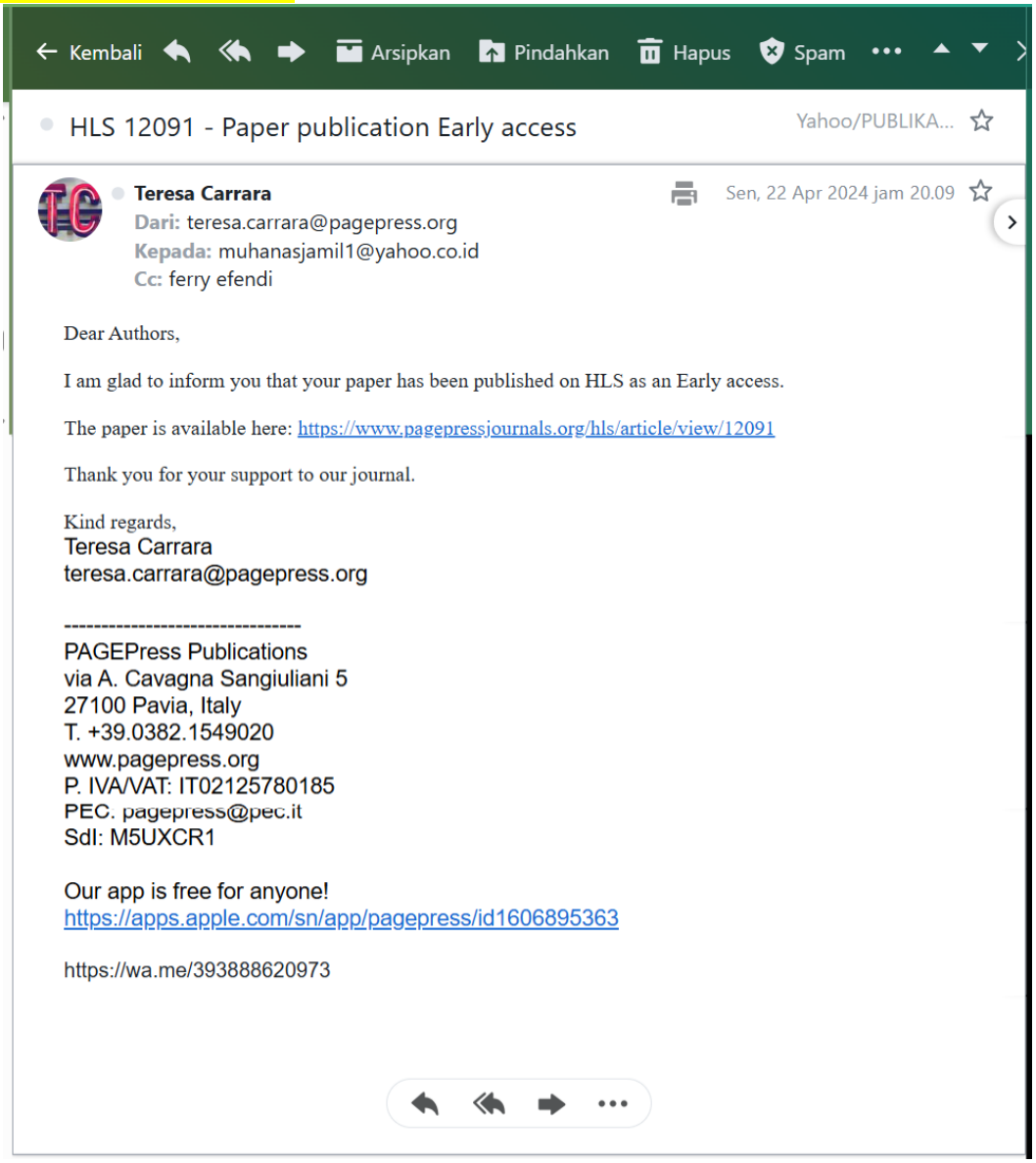

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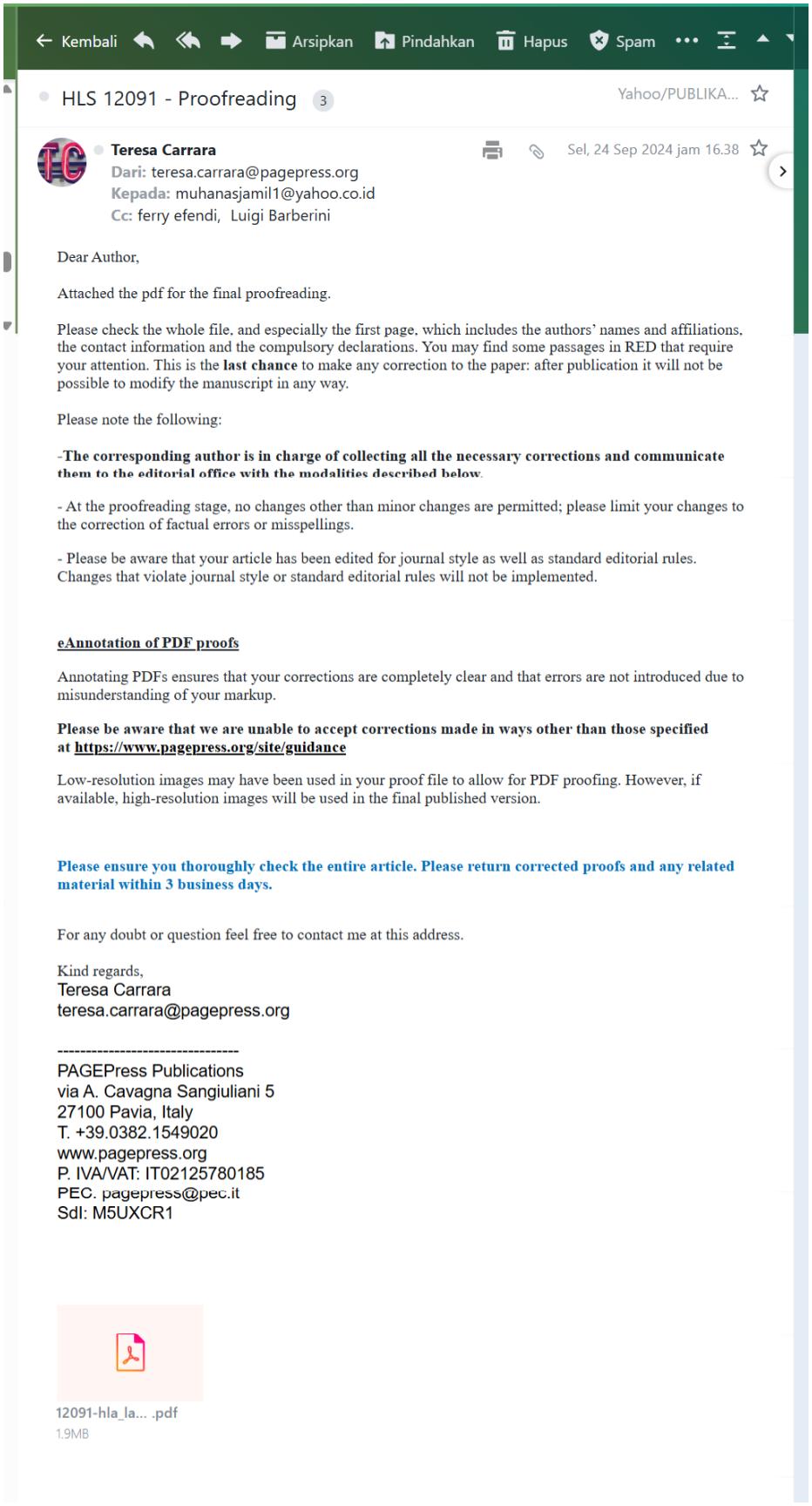

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Characteristics of mothers at risk for perinatal depression in industrial areas

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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.

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Key words: characteristics, industrial areas, mothers, perinatal depression, risks.

Contributions: MA, MDA, ECP, and UM conducted and designed this study; MDA, ECP, and UM collected samples; MA, MDA, ECP, and UM analyzed the data and wrote the manuscripts. All authors read and approved the final manuscript.

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Patient consent for publication: written informed consent was obtained for anonymized patient information to be published in this article.

Availability of data and materials: all data generated or analyzed during this study are included in this published article.

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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.

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)		
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

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.

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

Participant characteristics		Perinatal depression risk				Correlation coefficient (r)	p
		<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.

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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muhammad anas Rab, 25 Sep 2024 jam 00.46

Dari: muhanasjamil1@yahoo.co.id
Kepada: Teresa Carrara

Dear Teresa Carrara

There are three corrections in layout proof
1. Affiliation at the title Universitas Muhammadiyah become Universitas Muhammadiyah Surabaya
2. Location of Affiliation at correspondence , Indonesia become , Surabaya, Indonesia
3. Frequency and percentage at Table 1 Education, Further Education(Diploma, Bachelor, Master, Doctorate) 16 34
as attached pdf

Regards,
Muhammad Anas

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Noted, thanks!

Kind regards,
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Balas, **Balas ke semua** atau **Teruskan**

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.

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Key words: characteristics, industrial areas, mothers, perinatal depression, risks.

Contributions: MA, MDA, ECP, and UM conducted and designed this study; MDA, ECP, and UM collected samples; MA, MDA, ECP, and UM analyzed the data and wrote the manuscripts. All authors read and approved the final manuscript.

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Ethics approval and consent to participate: the research has received ethical approval from the Health Research Ethics Commission at the Universitas Muhammadiyah Surabaya. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence, and non-maleficence.

Patient consent for publication: written informed consent was obtained for anonymized patient information to be published in this article.

Availability of data and materials: all data generated or analyzed during this study are included in this published article.

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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.

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)		
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

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.

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

Participant characteristics		Perinatal depression risk				Correlation coefficient (r)	p
		<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.

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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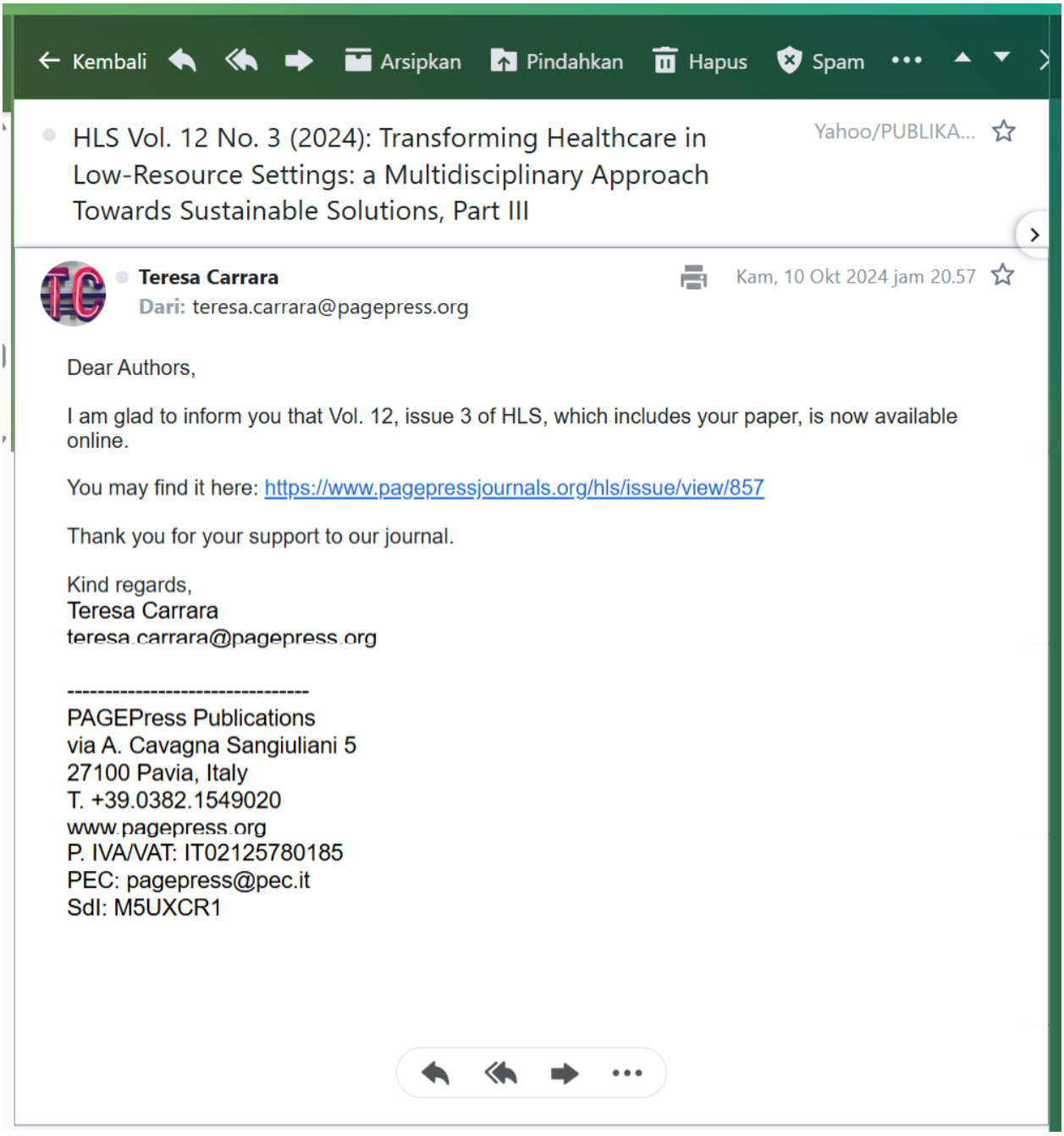

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Characteristics of mothers at risk for perinatal depression in industrial areas

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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.

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Key words: characteristics, industrial areas, mothers, perinatal depression, risks.

Contributions: MA, MDA, ECP, and UM conducted and designed this study; MDA, ECP, and UM collected samples; MA, MDA, ECP, and UM analyzed the data and wrote the manuscripts. All authors read and approved the final manuscript.

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Patient consent for publication: written informed consent was obtained for anonymized patient information to be published in this article.

Availability of data and materials: all data generated or analyzed during this study are included in this published article.

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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

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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.

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

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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.

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

Participant characteristics		Perinatal depression risk				Correlation coefficient (r)	p
		<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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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

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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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Title & Abstract

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Examples: A, The

Title

Characteristics of mothers at risk for perinatal depression in industrial areas

Subtitle

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

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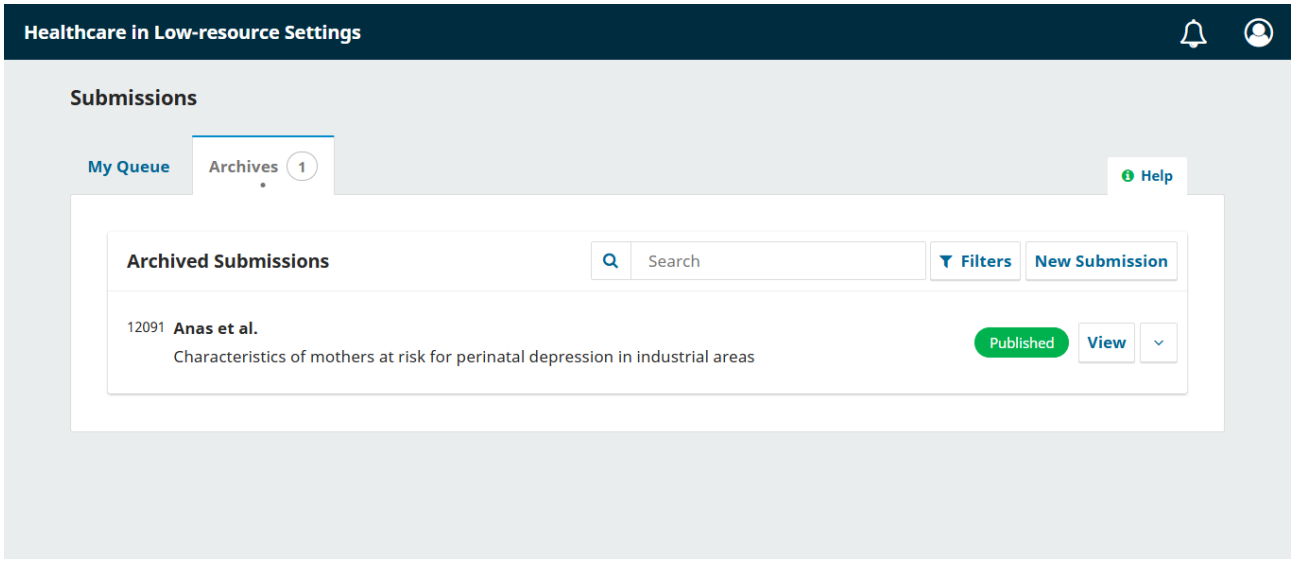
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Etik Penelitian

umsurabaya
UNIVERSITAS MUHAMMADIYAH SURABAYA | Fakultas Kedokteran

Surabaya, 18 Juli 2022

Nomor : 520.1/II.3.AU/FK/A/2022
Lamp. : 1 bendel
Hal : **Pengantar Uji Etik**

Yth.
Ketua KEPK UMSurabaya
di tempat

Assalamu'alaikum Wr. Wb.

Segala puji bagi Allah SWT atas segala karunia-Nya kepada kita, sholawat serta salam semoga senantiasa tercurahkan kepada Rasulullah SAW.

Dengan hormat, sehubungan dengan penyusunan Tugas Akhir (Skripsi) bagi mahasiswa Program Studi S-1 Pendidikan Dokter Fakultas Kedokteran Universitas Muhammadiyah Surabaya, kami bermaksud untuk memohon kepada Bapak/Ibu agar dapat memberikan izin untuk dilaksanakannya uji etik bagi penelitian mahasiswa :

Nama	: Muhammad Dzikri Abdillah
NIM	: 20191880016
Judul Penelitian	: GAMBARAN KARAKTERISTIK PADA IBU DENGAN RISIKO DEPRESI PERINATAL
Pembimbing I	: Dr. dr. Muhammad Anas, Sp. OG
Pembimbing II	: dr. Era Catur Prasetya, Sp. KJ

Demikian permohonan dari kami, atas perhatian dan kerjasama yang baik kami ucapkan terima kasih.

Wassalamu'alaikum Wr. Wb.

Dekan,
Fakultas Kedokteran UMSurabaya

dr. H. M. Jusuf Wibisono, Sp.P (K), FCCP, FIRS

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KOMITE ETIK PENELITIAN KESEHATAN
UNIVERSITAS MUHAMMADIYAH SURABAYA

KETERANGAN KELAIKAN ETIK
(*Ethical Clearance*)
No. Protokol: -

029/KET/II.3/AU/F/2022

KOMITE ETIK PENELITIAN KESEHATAN UNIVERSITAS MUHAMMADIYAH SURABAYA TELAH MEMPELAJARI SECARA SEKSAMA RANCANGAN PENELITIAN YANG DIUSULKAN, MAKA DENGAN INI MENYATAKAN BAHWA PENELITIAN DENGAN JUDUL:

"Gambaran Karakteristik pada Ibu dengan Risiko Depresi Perinatal"

PENELITI UTAMA : Muhammad Dzikri Abdillah
PENELITI LAIN : -
TEMPAT PENELITIAN : Rumah Sakit Muhammadiyah Gresik

DINYATAKAN LAIK ETIK.

Berlaku sejak : 01/08/2022 sampai dengan 01/08/2023

Surabaya, 01 Agustus 2022
KETUA

dr. H. M. Subkhan, Sp.P, MM, FAPSR
NIK. 012.09.1.1974.16.203

PEMERINTAH KABUPATEN GRESIK
BADAN PERENCANAAN PEMBANGUNAN, PENELITIAN DAN PENGEMBANGAN
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G R E S I K

Nomor	:	070 / 361 / 437.71 / 2022	Gresik, 27 Juli 2022	
Sifat	:	Penting	Kepada	
Lampiran	:	1 (Satu) Berkas	Yth	Dekan Fakultas Kedokteran Universitas Muhammadiyah Surabaya
Perihal	:	Rekomendasi Izin Penelitian / Survey/Riset/KKN/PKL		

Dasar

1. Peraturan Daerah Kabupaten Gresik Nomor 12 Tahun 2016 tentang Pembentukan Perangkat Daerah Kabupaten Gresik
2. Peraturan Bupati Gresik Nomor 38 Tahun 2019 tentang Kedudukan, Susunan Organisasi, Tugas, Fungsi dan Tata Kerja Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Kabupaten Gresik
3. Surat dari Dekan Fakultas Kedokteran Universitas Muhammadiyah Surabaya Nomor: 550/II.3.AU/FK/A/2022 tanggal 26 Juli 2022 Perihal Permohonan Ijin Penelitian

Maka dengan ini Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Kabupaten Gresik menyatakan tidak keberatan atas dilakukannya kegiatan yang dilakukan oleh

1.	Nama	:	Muhammad Dzikri Abdillah
2.	NIM/NIK/NIDN	:	3528010606010006
3.	Pekerjaan	:	Mahasiswa
4.	Alamat	:	Perum Bp Kulon Jl. Ikan Kerapu Barat II No. 1 Kelurahan Sidokumpul Rt 004 Rw 008, Kec Gresik, Kab.Gresik
5.	Keperluan dilakukannya Penelitian/Survey/Riset/KKN/PKL	:	Untuk melaksanakan Penelitian dengan judul "GAMBARAN KARAKTERISTIK PADA IBU DENGAN RISIKO DEPRESI PERINATAL"
6.	Tempat melakukan Penelitian/Survey/Riset/KKN/PKL	:	Rumah Sakit Muhammadiyah Gresik
7.	Waktu Pelaksanaan Penelitian/Survey/Riset/KKN/PKL	:	01 September 2022 - 30 September 2022
8.	Peserta/Pengikut	:	-

Dalam melakukan kegiatan Penelitian/Survey/Riset/KKN/PKL agar memperhatikan hal-hal sebagai berikut :

1. Sebelum dan setelah dilaksanakannya Penelitian/Survey/Riset/KKN/PKL diwajibkan melapor kepada Instansi terkait;
2. Tidak diperkenankan melaksanakan kegiatan lain diluar kegiatan Penelitian/ Survey/ Riset/ KKN /PKL yang dilakukan;
3. Setelah melakukan Penelitian/Survey/Riset/KKN/PKL selambat - lambatnya 1 (satu) bulan agar menyerahkan 1 (satu) ex. / buku hasil Penelitian/Survey/Riset/KKN/PKL kepada Bupati Gresik melalui Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Kabupaten Gresik;
4. Dalam pelaksanaan wajib mematuhi Protokol Kesehatan sesuai dengan Peraturan yang berlaku.

Demikian rekomendasi ijin Penelitian/Survey/Riset/KKN/PKL ini dibuat, untukdapat dipergunakan seperlunya.

An.KEPALA BADAN PERENCANAAN PEMBANGUNAN,
PENELITIAN DAN PENGEMBANGAN
KABUPATEN GRESIK
Kabid. Penelitian dan Pengembangan

DHIANNITA TRIASTUTI, S.T
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Tembusan
1. Badan Kesatuan Bangsa Dan Politik
2. Dinas Kesehatan
3. Rumah Sakit Muhammadiyah Gresik

PEMERINTAH KABUPATEN GRESIK
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Jl. Dr. Wahidin Sudirohusodo Nomor 245 Gresik
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GRESIK

Gresik,01 September 2022

Nomor :070/4661/437.52/2022
Sifat :Biasa
Lampiran :-
Perihal :Izin Penelitian - dzikri

Kepada
Yth. Direktur Rumah Sakit Muhammadiyah Gresik
di Gresik

Menindaklanjuti surat dari Badan Perencanaan Pembangunan Penelitian dan Pengembangan Kabupaten Gresik nomor 070/361/437.71/2022 27 Juli 2022 tentang pengantar rekomendasi izin penelitian maka bersama ini di sampaikan bahwa tidak keberatan atas dilakukannya kegiatan yang di lakukan oleh

Nama	: Muhammad Dzikri Abdillah
NIM	: 3528010606010006
Judul Penelitian	: "Gambaran karakteristik pada ibu dengan risiko depresi Perinatal"
Tempat Penelitian	: Rumah Sakit Muhammadiyah Gresik
Waktu pelakasaan	: 1 September 2022 – 30 Setember 2022

Dalam melakukan kegiatan Penelitian agar memperhatikan hal – hal sebagai berikut:

1. Mematuhi peraturan yang berlaku
2. Menerapkan protokol kesehatan

Demikian atas perhatian dan kerjasamanya disampaikan terima kasih

Kepala Dinas Kesehatan
KABUPATEN GRESIK

dr. MUKHIBATUL KHUSNAH, MM.
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SURAT KETERANGAN

Nomor : 768/KET/III.6.AU/F/2022

Yang bertanda tangan di bawah ini :

Nama : **dr. Imam Suyuthi, Sp.An**
Jabatan : **Direktur**

Menerangkan dengan sebenarnya bahwa :

Nama : **Muhammad Dzikri Abdillah**
NIM/NIK/NIDN : **3528010606010006**
Asal Pendidikan : **Fakultas Kedokteran Universitas Muhammadiyah Surabaya**
Program Studi : **S1 Pendidikan Dokter**
Judul Penelitian : **Gambaran Karakteristik Pada Ibu Dengan Resiko Depresi Perinatal**

Telah selesai melakukan penelitian di Rumah Sakit Muhammadiyah Gresik mulai tanggal 16 – 23 September 2022.

Demikian surat keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

Gresik, 18 Oktober 2022

Direktur

dr. Imam Suyuthi, Sp.An
NBM : 1.312.914

INFORMED CONSENT

(PERNYATAAN PERSETUJUAN IKUT PENELITIAN)

Yang bertanda tangan dibawah ini :

Nama :

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Pekerjaan :

Alamat :

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Telah mendapat keterangan secara terinci dan jelas mengenai :

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2. Perlakuan yang akan diterapkan pada subyek
3. Manfaat ikut sebagai subyek penelitian
4. Bahaya yang akan timbul
5. Prosedur Penelitian

dan prosedur penelitian mendapat kesempatan mengajukan pertanyaan mengenai segala sesuatu yang berhubungan dengan penelitian tersebut. Oleh karena itu saya **bersedia/tidak bersedia***) secara sukarela untuk menjadi subyek penelitian dengan penuh kesadaran sertatanpa keterpaksaan.

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Peneliti, Responden,

....

Saksi,

.....

Lampiran 1. ***Informed Consent*** **Responden**

INFORMED CONSENT

(PERNYATAAN PERSETUJUAN IKUT PENELITIAN)

Utc. 7 bln

Yang bertanda tangan dibawah ini :

Nama : Aily Nuni hidayah

Umur : 28 thn

Pekerjaan : Guru

Alamat : Kroman

No. Hp : 089 688 216 200

7 Februari 2022

Telah mendapat keterangan secara terinci dan jelas mengenai :

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3. Manfaat ikut sebagai subyek penelitian
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dan prosedur penelitian mendapat kesempatan mengajukan pertanyaan mengenai segala sesuatu yang berhubungan dengan penelitian tersebut. Oleh karena itu saya **bersedia/~~tidak bersedia~~***) secara sukarela untuk menjadi subyek penelitian dengan penuh kesadaran sertatanpa keterpaksaan.

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Grosu, 16-September 2022

Peneliti,

M. Dzikri Abdillah

Responden,

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Characteristics of Mothers at Risk for Perinatal Depression in Industrial Areas

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Contributions:

This study was conducted and designed by MA, MDA, ECP, and UM. MDA, ECP, and UM performed sample collection. MA, MDA, ECP, and UM analyzed data and wrote the manuscripts. All authors read and approved the final manuscript.

Conflict of interest:

The authors declare no conflict of interest.

Ethics approval and consent to participate:

The research has received ethical approval from the Health Research Ethics Commission at the Universitas Muhammadiyah Surabaya. During the research, the researcher pays attention to the ethical principles of information to consent, respect for human rights, beneficence, and non-maleficence.

Patient consent for publication:

Written informed consent was obtained for anonymized patient information to be published in this article.

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Availability of data and materials:

All data generated or analyzed during this study are included in this published article.

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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.

Keywords: characteristics, industrial areas, mothers, perinatal depression, risks

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 Etude 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 percent 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 had adjusted the research criteria to contain 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

Data analysis in this study was carried out univariately to describe the characteristics of the respondents and continued with a bivariate test with the Spearman rank test 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.

Table 1 Distribution of respondents' characteristics

No	Characteristics		F	%
1	Religion	Islam	47	100,0
		Non-Islam	0	0
2	Ethnic	Javanese	40	85,1
		Sundanese	2	4,3
		Batak	0	0,0
		Madurese	3	6,4
		Banjar	0	0,0
		Bali	0	0,0
		Betawi	1	2,1
		Minangkabau	1	2,1
		Bugis	0	0,0
		Melayu	0	0,0
3	Age (years old)	<20	0	0,0
		20-35	40	85,1
		>35	7	14,9
4	Education	Basic education (Elementary to Senior High School)	31	66,0
		Further education (Diploma/Bachelor/ Master/Doctorate)	16	34,0
5	Job-status	Unemployed	26	55,3
		Employed	21	44,7
6	Family Income	Below Regional Minimum Wage (RMW)	16	34,0
		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	0,0
8	Last delivery	Never	23	48,9
		Normal	16	34,0
		Sectio Caesarea	8	17,0

9	Complication history	No	45	95,7
		Yes (Prolonged labor, postpartum bleeding)	2	4,3
10	Depression history	Noting	47	100,0
		Yes	0	0,0
11	Family Depression history	Noting	47	100,0
		Yes	0	0,0
12	Perinatal Depression Risk	Not depressed	19	40,4
		Possible depression	18	38,3
		The probability of depression is relatively high	8	17,0
		Depression is very likely	2	4,3

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 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		
	Sectio Caesarea	7	0	1	0		
Perinatal Depression Risk			<8=	Not depressed			
			9-11=	Possible depression			
			12-13=	The probability of depression is relatively high.			
*=signifcant (p<0,05)			>=14=	Depression is very likely			

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. 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 prevalence 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, 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 [34,38]. 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 [38]. 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 [38,39]. 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 [38]. 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 [40]. 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 [41].

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 [35,38]. 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 [42,43].

Research at RS Muhammadiyah Gresik revealed a significant negative correlation between prenatal childbirth, normal childbirth, and Sectio Cesaria (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 [41]. 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 [41]. Childbirth trauma can cause depression in mothers, affecting mood, stress, and anxiety during labor and postnatal healing [42]. 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 [44].

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 show 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 [38].

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. The incidence of prenatal depression risk was found to be linked with maternal age, work status, parity, and the latest delivery in this study.

CONCLUSION

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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