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Relevance of Sociodemographic Status to the Potential for Perinatal Depression Post-Natural Disasters

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Abstract

Indonesia is one of the countries at high risk of disasters due to its geographical and geological conditions. Based on the 2022 Indonesian Disaster Risk Index measurement, West Sumatra Province is included in the high-risk category with a value of 144.39, indicating a high disaster threat, namely earthquakes, tsunamis, volcanoes, floods, landslides, droughts, extreme weather, extreme waves and abrasion, and forest and land fires. The effects of natural disasters can trigger an increase in depressive symptoms during and after pregnancy, which is a serious threat to global public health. WHO data from 2024 show that almost 300 million people need humanitarian assistance, with an increased risk of mental health issues in disaster-affected populations. This study aimed to analyze the relationship between socio-demographic status and the potential incidence of perinatal depression post-natural disasters in West Sumatra. This is an analytical observational study with a cross-sectional approach conducted in Agam Regency, Tanah Datar Regency, and Padang City. Data collection was carried out in October-December 2024. The sample comprised 23 pregnant women, selected using purposive sampling. The research instrument used was the Edinburgh Postnatal Depression Scale (EPDS) Questionnaire. Data were analyzed univariately and bivariately with the Chi-Square test with a significance level of $\alpha = 0.05$. The results of this study showed that 52% of pregnant women experienced perinatal depression. The bivariate analysis yielded significant values for the variables: age p = 0.001), education p = 0.001), occupation p = 0.003), parity p = 0.036), family income p = 0.009), and history of miscarriage p = 0.007). It was concluded that all these variables were related to the potential for perinatal depression in pregnant women post-natural disasters in West Sumatra, Indonesia. Socio-demographic factors are very important to pay attention to in pregnant women, in order to reduce the risk of perinatal depression after natural disasters through routine health education programs by health workers.

Keywords: Perinatal, depression, post-natural disaster, socio-demographic

Introduction

Perinatal depression is a mood disorder that occurs during pregnancy and after delivery, typically beginning within 4–8 weeks of birth (National Institutes of Health, 2023). Perinatal depression, or antenatal depression, is a form of clinical depression that can be caused by stress and anxiety that can worsen pregnancy, negatively impacting the mother, family, and wider society (Chala & Desalegn, 2024). The perinatal period is a time of increased vulnerability to negative mood symptoms, driven by changes in the mother and her environment (Barkin et al., 2024). Worldwide, approximately 1 in 5 pregnant women experience perinatal depression (Sarem et al., 2024).

Perinatal depression can cause adverse pregnancy complications for both the mother and the fetus (Jacovides et al., 2024). Perinatal depression increases the risk of complications for both mother and child, can interfere with fetal development, increase the risk of preeclampsia, and premature birth (Sarem et al., 2024). Perinatal depression in pregnant women is associated with various sociodemographic characteristics that contribute to several pregnancy complications. Therefore, it is crucial to maintain the perinatal mental health of pregnant women by developing and implementing strategies and public policies for counseling and psychological support for pregnant women to minimize risk factors that can trigger perinatal depression (Jacovides et al., 2024). Screening for depression in pregnant women is crucial because if not diagnosed and treated early, it can progress to postnatal depression (Míguez et al., 2021).

The prevalence of depression is higher in pregnant women compared to the general population, due to the influence of hormonal factors during pregnancy (Fekadu et al., 2020). Depression is the most common postpartum psychological problem affecting the health of both mothers and infants (Hajipoor et al., 2021). Maternal depression (antepartum or postpartum) is a leading cause of pregnancy-related morbidity and mortality. It has been linked to negative health behaviors and has negative consequences for mothers, including psychological and developmental disorders in infants, children, and adolescents (Míguez et al., 2021).

Perinatal depression caused by natural disasters can result in mild mental disorders, low birth weight, premature birth, smaller head circumference, and delayed fetal brain development (Sarem et al., 2024). The impact of perinatal depression can negatively impact newborns and child development (Míguez et al., 2021). Pregnant women are a vulnerable population exposed to natural disasters, which can lead to psychological consequences or post-traumatic stress disorder. Therefore, the impact of disaster-induced depression on pregnant women cannot be ignored (Chala & Desalegn, 2024).

Perinatal depression, or antenatal depression, is a depressive episode that occurs during pregnancy. Perinatal depression is a very serious depressive disorder and, if left untreated, can progress to more serious conditions such as postpartum psychosis (Harville et al., 2021). Perinatal depression is the most common mental disorder during pregnancy and is caused by various factors, including sociodemographic, obstetric, and psychological factors, which are strongly associated with the incidence of perinatal depression (Míguez et al., 2021).

Some risk factors for perinatal depression include sociodemographic factors, including

obstetric factors (Míguez et al., 2021). Sociodemographic factors that influence disaster-related depression include age, financial/economic status, and complications during previous pregnancies (Pillai et al., 2023). Social determinants of health can worsen the psychological well-being of pregnant women, infants, and other vulnerable populations affected by disasters (Harville et al., 2021).

Based on these issues, researchers are interested in conducting a preliminary study on the relevance of sociodemographic status to the potential incidence of perinatal depression following a natural disaster in West Sumatra, Indonesia.

Literature Review

Natural disasters are geophysical and weather-related events (Martínez-gonzález et al., 2024) or large-scale adverse events caused by natural processes that can threaten the lives or deaths of many people, disrupt services and social networks, cause loss of resources, and impact mental and physical health (Saeed, S. A., & Gargano, 2022). In 2022, 387 natural disasters worldwide affected 185 million individuals and resulted in 30,704 deaths (Martínez-gonzález et al., 2024). The increasing frequency of disasters can exacerbate emotional, financial, and physical stress on affected individuals (Sabbagh & Choi, 2025).

Pregnant women are considered one of the most vulnerable groups during disasters (Silva-suarez et al., 2021). Natural disasters can cause mood disorders or anxiety in vulnerable groups, such as pregnant women (Martínez-gonzález et al., 2024). Women during the perinatal period face unique stressors, including hormonal changes, role transitions, and the potentially enormous responsibility of caring for a newborn, which can exacerbate the mental health impacts of experiencing a traumatic event such as a natural disaster (Sabbagh & Choi, 2025).

Natural disasters can be stressful for pregnant women, causing maternal stress during pregnancy, which negatively impacts fetal development, childhood, and adulthood (Silva-suarez et al., 2021). Short-term adverse impacts of disasters on women during the perinatal period include physical trauma, exposure to hazardous environments, displacement that threatens basic needs, limited access to health services, and increased stress (Sabbagh & Choi, 2025). Long-term impacts of disasters include changes in family functioning, relocation, and negative economic impacts (Harville et al., 2021).

Perinatal depression due to natural disasters can increase the risk of pregnancy complications, miscarriage, and infant health problems, such as premature birth (Sabbagh & Choi, 2025) birth defects, poor child development that can have long-term and lifelong consequences (Harville et al., 2021), reduced birth weight and small head circumference, and other neonatal complications. Children exposed to natural disasters during pregnancy, mothers experiencing depression and having symptoms of post-traumatic stress, will affect the child's immunological and metabolic systems in the long term (Veenema et al., 2023). Mothers who experience perinatal depression are 36% more likely to harm their babies and 34% more likely to have weak attachment to their children (Pillai et al., 2023). Therefore, disaster preparedness programs for the perinatal population are crucial for addressing the challenges posed by natural

disasters and reducing long-term mental health risks (Sabbagh & Choi, 2025). Interventions that can improve disaster prevention, mitigation, and response for pregnant women are necessary (Harville et al., 2021).

Risk factors for perinatal depression are, first, sociodemographic factors such as low maternal education, younger maternal age (Fu et al., 2026) or middle-aged women who are pregnant during a disaster, potentially experiencing high levels of stress during childbirth (Pillai et al., 2023), low family economic status (Fu et al., 2026) or unfavorable socioeconomic factors, such as poverty and financial stress, significantly increase the risk of the pathogenesis of perinatal depression (Pillai et al., 2023). Second, psychological factors such as adverse life events, such as being affected by a disaster, life stress, and physiological or biological factors, such as medical conditions or chronic diseases (Fu et al., 2026).

Research Method

This research is an analytical observational study with a cross-sectional design, conducted in Agam Regency, Tanah Datar Regency, and Padang City, West Sumatra Province, Indonesia. Data collection was conducted from October to December 2024. The study sample consisted of 23 pregnant women affected by or victims of natural disasters. The sampling technique was purposive sampling. The research instruments used were a structured questionnaire on sociodemographic characteristics and the Indonesian version of the Edinburgh Postnatal Depression Scale (EPDS). Prior to data collection, written consent was obtained from all pregnant women. Participants were guaranteed privacy and confidentiality of data. Data were analyzed univariately and bivariately using the Chi-Square test with $\alpha = 0.05$ in SPSS.

Results

Table 1. Relationship between Socio-Demographic Status and the Incidence of Perinatal Depression After Natural Disasters

Characteristics (n=23)	**Pregnant Women's Perinatal Depression**		***p*-Value**
	Depression 12 (52,2%)	**No Depression 11 (47,8%)**	
Pregnant women's age (n, %)			
> 35-year-old	9 (75%)	0 (0%)	$p = 0.001$
20-35-year-old	3 (25%)	11 (100%)	
Pregnant women's education level (n, %)			$p = 0.001$
Low	10 (83.4%)	0 (0%)	
High	2 (14.6%)	11 (100%)	
Pregnant women's occupation status (n, %)			$p = 0.003$
Not Working	11 (91.7%)	3 (27.3%)	
Working	1 (8.3%)	8 (72.7%)	

Parity (n, %)			
Multiparity	10 (83.4%)	4 (36.4%)	$p = 0.036$
Nulliparity	2 (14.6%)	7 (63.6%)	
Family income status (n, %)			
< Regional Minimum Wage	11 (91.7%)	4 (36.4%)	$p = 0.001$
≥ Regional Minimum Wage	1 (8.3%)	7 (63.6%)	
History of miscarriage (n, %)			
Ever	10 (83.4%)	2 (18.2%)	$p = 0.007$
Never	2 (14.6%)	9 (81.8%)	

Discussion

Based on the results of the study obtained from 23 pregnant women affected by the natural disaster in West Sumatra, 12 (52%) experienced perinatal depression. According to Hajipoor et al. (2021), approximately 63.7% of mothers experience postpartum depression (Hajipoor et al., 2021). The results of the study (Al-abri et al., 2023) found an average prevalence of perinatal depression of 26.3%, antenatal depression of 28.5%, and postnatal depression of 27.6%. Although the significant differences are relatively small, evidence suggests that antenatal depression causes an increased risk of developing postnatal depression.

The prevalence of perinatal depression varies slightly by country's income. The highest prevalence is found in low- and middle-income countries. The relevance of perinatal depression is high in women who have experienced natural disasters, at 34.8%. Findings from a systematic review and meta-analysis of 589 studies and outcomes from 616,708 women from 51 countries, perinatal depression was reported to occur in 1 in 4 women (24.7%). Perinatal depression during pregnancy and up to 1 year postpartum in low- and middle-income countries is common and urgently requires action to improve the health of women and babies. The prevalence estimates from this study serve to provide evidence of the substantial burden of perinatal depression on individuals in low- and middle-income countries and to demonstrate the urgent need to recognize perinatal depression as a global public health priority (Roddy Mitchell et al., 2023).

Therefore, early screening for depressive symptoms and diagnosis by healthcare professionals (including nurses, midwives, and doctors) during pregnancy is crucial to prevent postnatal depression by providing early intervention and support. Rates of perinatal depression are higher in vulnerable populations. Early detection of perinatal depression is known to be crucial for maternal and neonatal health care. Particular attention is needed to assess and screen for depressive symptoms during the perinatal and postnatal periods. Since the perinatal period is the most common time for women to come into contact with healthcare providers, it is during this period that women at risk can be identified and supported (Al-abri et al., 2023).

Cross-tabulation in Table 1 shows that the incidence of depression in pregnant women after a natural disaster is strongly associated with the risk age of >35 years and the employment status of unemployed ($p = 0.001$ and $p = 0.003$). The incidence of perinatal depression in

pregnant women is significantly associated with low educational status and family income (p = 0.001 and p = 0.001). Pregnant women with perinatal depression are significantly more likely to be multiparous and have a history of miscarriage (p = 0.036 and p = 0.007).

Parental age dynamics can contribute to differing views on parenting roles that have the potential to create psychological stress that continues to increase vulnerability to perinatal depression (Fu et al., 2026). The prevalence of depression in women who had just given birth was significantly higher in women aged 40 to 44 years compared to women aged 30 to 35 years. Women with advanced maternal age had significantly higher rates of depression than younger women. Research is needed to determine whether targeted depression screening and prevention programs will help reduce the burden of disease among older mothers.

This study aligns with research (Jacovides et al., 2024) on the association between pregnant women's perinatal depression and sociodemographic, Anthropometric, and lifestyle factors, as well as perinatal and postnatal outcomes, conducted on 5,314 pregnant women. Perinatal depression was significantly associated with lower education levels (p = 0.0077). Lower education levels are an independent risk factor for postpartum depression. A stronger association between lower education levels and the prevalence and symptoms of postpartum depression was found.

Research conducted by Gebregziabher et al. (2020) on Prevalence and associated factors of postpartum depression among postpartum mothers in the central region, Eritrea: a health facility-based survey conducted on 380 women found that 16 people experienced postpartum depression among housewives or unemployed mothers. Statistically obtained p-value 0.002, which means there is a relationship between employment status and the incidence of postpartum depression (Gebregziabher et al., 2020). Women who do not work or mothers who work as housewives have a lower chance of experiencing postpartum depression (p = 0.046) (Gebregziabher et al., 2020).

Mothers with high parity (multiparity), or mothers who have given birth to many children, often face greater stress during pregnancy and caring for their children, which can increase the risk of depression. There is a significant relationship between parity and perinatal depression (p=0.028). Perinatal depression is significantly associated with parity, namely, multigravida (Zulaiha & Surjaningrum, 2024).

This study aligns with research by Jacobides et al. (2024) on the Association of Pregnant Women's Perinatal Depression with Sociodemographic, Anthropometric, and Lifestyle Factors and Perinatal and Postnatal Outcomes: A Cross-Sectional Study conducted on 5,314 pregnant women. Perinatal depression was significantly associated with lower family income status (p = 0.0007) (Jacovides et al., 2024). Women living in low-income countries have an estimated 20-40% risk of experiencing postpartum depression (Gebregziabher et al., 2020). The socioeconomic status of pregnant women and the burden of health disparities are closely related to maternal mental health during the perinatal period (Harville et al., 2021). Pregnant women with low economic status have a statistically significantly higher risk of postpartum depression (Gebregziabher et al., 2020). Economic vulnerabilities among perinatal women, such as food insecurity and inability to afford hospital visits, can exacerbate psychological distress (Pillai et

al., 2023). Geographical challenges, such as disasters, economic disparities, and a lack of healthcare interventions, make them more vulnerable to depressive symptoms (Fu et al., 2026).

A study conducted by Gebregziabher et al. (2020) on the prevalence and associated factors of postpartum depression among postpartum mothers in the central region of Eritrea: a health facility-based survey found that out of 266 samples, 11 women experienced postpartum depression with a history of previous miscarriage. Statistically, the p-value was 0.323, indicating no association between a history of miscarriage and the incidence of postpartum depression (Gebregziabher et al., 2020).

Factors influencing perinatal depression vary dynamically across gestational stages, with increased risk factors during early pregnancy and postpartum. Therefore, it is necessary to identify how psychosocial, physiological, and biological factors interact over time to shape maternal mental health during the perinatal period (Fu et al., 2026).

This preliminary study indicates that 52% of pregnant women experienced perinatal depression after a disaster in West Sumatra. Perinatal depression is a significant maternal mental health problem in disaster-prone areas. The results of this study indicate a significant association between perinatal depression and age, education, occupation, parity, family income, and history of miscarriage. These findings underscore the importance of integrating depression screening using the EPDS into routine antenatal care so that women in disaster-prone areas who require intervention can be detected and treated early, thus preventing adverse outcomes.

Conclusion

In summary, the socio-demographic status of pregnant women: risk age >35 years, low education, employment status is not working, multiparity, family income is < Regional Minimum Wage, and having had a miscarriage is related to the incidence of perinatal depression after a natural disaster. For the prevention of perinatal depression after natural disasters, sociodemographic factors should be considered by focusing on high-risk groups in developing and implementing educational programs, early screening of perinatal depression symptoms, and comprehensive social support for pregnant women.

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