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## **Determinants of Postpartum Depression In Rural Area, Central Java, Indonesia**

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### **Keywords**

Husband Support;  
Family Support;  
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Depression Symptoms

### **Abstract**

Postpartum Depression (PPD) is a severe complication of labor result in an adverse effect on maternal and neonatal health. Nevertheless, the factors associated with postpartum depression are very rarely examined during postpartum care. This study aimed to discover the determinants of postpartum depression among mothers in rural area, Central Java, Indonesia. The design of the study was observational analytic with a cross-sectional approach. The setting of the study was in Sukoharjo Regency. Participants of the study were 160 mothers, ages 20-35 years old, during 4-8 weeks of postpartum, taken using a multistage-random sampling. The instrument used were two questionnaires: (1) questionnaire on the socio-demographic; and (2) the Edinburgh Postpartum Depression Scale (EPDS) questionnaire. The questionnaires were distributed to mothers' at their houses by the interviewers. The statistical tool used to analyze the data is logistic regression with odds ratio analysis. The result findings show that the determinants of postpartum depression are occupations ( $p=0.012$ ), husband support ( $p=0.010$ ), family support ( $p=0.027$ ), social support ( $p=0.025$ ), pregnancy planning ( $p=0.025$ ), monthly income ( $p=0.021$ ). PPD is not associated with age ( $p=0.417$ ), parity ( $p=0.977$ ), and level of education ( $p=0.892$ ). Key conclusion: educational program on postpartum depression is needed to prevent the occurrence of postpartum depression.

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### **Introduction**

Postpartum depression (PPD) is a common, non-psychotic mood or mental disorder that typically manifests in one year of delivery (one year postpartum). Globally, the Prevalence of PPD among mothers varies from 0.5 to 60.8% (1). Women in developed countries have a lower risk of PPD than women in developing countries (2). A systematic review reported that the prevalence of PPD symptoms among mothers in developing countries with low-income was 6–13% higher than mothers in developed countries (3). A systematic review of low and middle-income countries (LMIC) found the prevalence of postpartum common mental disorder was approximately 20% (4). Asian countries reported between 3.5–63.3% prevalence rates of depression in postpartum women (5). In Indonesia, the prevalence of PPD in a rural area was 18.5% (6). In another study in Indonesia stated that 22% of mothers had mild levels of depression (7).

Generally, PPD develops during 4-6 weeks after childbirth. The symptoms are similar to severe depression, such as low interest in fun activities, sleep deprivation, appetite disturbances, low energy, low self-worth, guilt, decreased concentration, irritability, and suicidal thoughts. Pregnancy and childbirth are a fast transition of the women's role and responsibility that may lead to PPD (8). PPD is a severe mental disorder. Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-V) define PPD as part of severe depression (9). One of the instruments for measuring symptoms is the Edinburgh Postnatal Depression Scale (EPDS) (10).

Moreover, the developed postpartum depression symptoms among mothers need early treatment to prevent the emergence of complications. The complications of untreated PPD for mothers are overweight, alcohol consumption, drugs, social relationship problems, breastfeeding problems, or chronic depression compared to those who receive medical treatment (11). The effect of PPD on children is low cognitive function, behavioral disorder, inability to control emotion, violent behavior, and psychiatric disorders and medical disorders in adolescence (12–14).

Furthermore, a qualitative study on the perception of the cause of postpartum depression resulted in the nine causes underlying women's depressive symptoms: societal expectations and pressure on women, physical health problems, the transition to parenthood, social connectedness, personality, and past psychological history, child health and temperament challenges, unmet care needs, unmet expectations for childbirth, and other life stressors (15).

Additionally, the prevalence of PPD is higher among mothers in rural areas in developing countries, as supported by the studies. In Uganda's rural areas, a study with participants' mean age and children was  $24\pm 4.33$  years and  $2.85\pm 1.26$  children. The majority of participants were married (61%), delivered the current infant by standard vaginal delivery (91%) at a health facility (86%), and experienced no complications (80%). The mean EPDS score for the sample was  $9.5\pm 0.18$ , and 43% of the participants had depression scores of more than 10. The factors are the number of female sexual partners the husband has ( $r=0.28$ ,  $p\leq 0.01$ ); current problems in marriage ( $r=0.22$ ,  $p\leq 0.01$ ), participant's parity ( $r=-0.24$ ,  $p\leq 0.05$ ), infant's ability to breastfeed ( $r=0.28$ ,  $p\leq 0.05$ ) and husband support during the postpartum period ( $r=0.20$ ,  $p\leq 0.05$ ) (16).

A study conducted in another developing country, Brazil, stated a significant association between maternal age with PPD (OR=0.96,  $p$ -value=0.019) (17). Young mothers tend to manifest postpartum depression. Adaptive mechanisms shaped through human generations persist, contributing to the development of PPD in contemporary societies. As maternal age advances, the reproductive potential diminishes and, consequently, mothers are less prone to develop PPD and reduce investment in new offspring. In contrast, another study found that women of advanced maternal age between 40-44 years have significantly higher rates of depression than younger women aged 30-35 (adjusted OR among women 40 to 44 years 0.75; 95% CI 0.56 to 1.01) (18). It can be concluded that younger women (less than 20 years old) and older women (40-44 years old) have a higher risk of PPD in developing countries.

On the other hand, maternal parental self-efficacy negatively relates to maternal stress, anxiety, and postpartum depression. It also has a significant relationship with the number of children, social support, maternal parenting satisfaction, and marital satisfaction (19). Following these findings, a study in Surakarta, Central Java, Indonesia found that parity is the direct risk factors of postpartum depression (20).

Also, monthly family income is a factor related to PPD. Mothers who have occupations earn more money to add family income. A study to support this finding, as conducted in Osaka, Japan, among postpartum mothers who have occupation and income was independently inversely associated with postpartum depression, adjusted OR was 0.52 (95% CI: 0.26–0.96). Regarding the type of job held, women with a professional or technical job had a significantly reduced risk of postpartum depression: the adjusted OR were 0.29 (95% CI: 0.09–0.72). Clerical or related occupations and other occupations, including sales, service, production, and construction, were not associated with postpartum depression (21).

Besides, social support is a significant factor associated with PPD. Social support is categorized into four types: emotional, instrumental, informational, and appraisal. Social support can come from various sources but is not limited to the husbands, family, peers, coworkers, and community ties.

Husbands' continuous support during childbirth is considered useful in reducing mothers' dissatisfaction with the childbirth process. Among mothers supported by their husbands reported low anxiety and lower level of depression (22). A study found that male partners of postpartum women are a significant source of the factors related to PPD symptoms among mothers (16).

Likewise, family support is a significant factor in maternal depression. Mothers who received strong family support were less likely to experience PPD (20). Support is the most potent and consistent personal predictor of personal adjustment. The family is the primary source of support for postpartum women's health (23).

Furthermore, community support is an essential predictor of postpartum depression (24). Peer support significantly reduced depression symptoms among mothers (25). A study among China's primiparous mothers found a significant increase in social support significantly reduced the EPDS score (26). Mothers who attended the peer support group intervention for postpartum women reported substantial changes in depression over time (27).

Moreover, maternal emotional response to neonates is associated with postpartum mothers' psychological status in caring for the neonates and building a mother-infant relationship. A study examining the mother-infant relationship quality found that higher postpartum depression scores were associated with low postpartum bonding score (28). It can be concluded that a strong maternal-infant relationship was associated with a low PPD score.

Pregnancy planning enables mothers to prepare themselves to welcome new role changes into taking care of neonates/infants that significantly affect their physical and emotional aspects. Mothers must plan their pregnancy because the unplanned pregnancy has dramatically increased the risk of postpartum depression. They had lower adaptive behavior, felt negative feelings during labor, and felt more severe pain (29). Pregnancy planning promotes the management of financial, informational,

psychological, and instrumental before childbirth. Mothers have more sense of control in the maternal adjustment to reduce the risk of PPD.

Furthermore, low education levels, unemployment, cesarean birth, and more than one young child were significantly related to PPD risk (30). In contrast, a study showed no relationships between household income or maternal and paternal educational levels to postpartum depression (21).

The knowledge about the community's mental health resulted that only 17.6% (18 out of 102 respondents) had a good experience with mental health (31). This low percentage of women's literature on mental health means that only the minority of the community understands mental health. The consequences of that are the poor attitude towards mental health attitude towards those in need. Another supporting study found that the mental health literacy of the community is high. Still, the attitude towards searching for mental health formal intervention from the health care provider is low (32).

The *Edinburg Depression Postpartum Scale* (EPDS) (10) is a useful, reliable, and validated screening tool to measure of depression after childbirth (33). It has ten items scored on a 4-point Likert scale, with a maximum score of 30. A score of 12 or above can identify women with major depression. However, a cut-off score of 10 significantly reduces the risk of failing to identify mothers within community samples who may display milder depression (10). Therefore, a minimum score for the study inclusion criterion was 10.

Additionally, in Indonesia, the mental health of postpartum mothers rarely gets special attention from health workers. In urban and rural areas, health professionals are not prepared for perinatal care standards for assessing mothers' mental state. According to the previous observation in clinical and community settings in Sukoharjo, Indonesia, perinatal care focuses primarily on physical health and infants. Hence, there is no enough attention, a thorough examination of mothers and infants' mental health.

A preliminary study on mental health literacy among ten midwives in Sukoharjo Regency showed six midwives did not know about mental health during postpartum. Furthermore, from an interview with ten postpartum mothers, 6 showed depression symptoms, and none of them ever consulted their problems to health personnel in a health institution. Moreover, they cannot get adequate intervention. From interviews with husbands, 7 out of 10 husbands did not know about depression and its symptoms. Based on the study findings above, this study aimed to investigate the determinants of PPD in the rural area of Sukoharjo, Indonesia.

## Methods

The study was an observational analytic, cross-sectional approach. The study was conducted in the area of Sukoharjo Regency from March - June 2019. The population of the course was all mothers during 4-8 weeks postpartum. The sampling technique was multistage-random sampling, with a total of 160 respondents. The sampling was selected randomly from a village located in 5 out of 12 districts. The instrument of the study was two questionnaires, (1) questionnaire on the socio-demographic, husband support, family support, pregnancy planning, emotional response to neonates, monthly income; and (2) the Edinburgh Postpartum Depression Scale (EPDS) questionnaire. The questionnaires were distributed to mothers' at their houses by the interviewers. The statistical tool used to analyze the data is logistic regression with odds ratio analysis.

## Results

Table 1. Socio-demographic Variables of Postpartum Mothers

Socio-demographic Variables	Frequency	%
<b>Age</b>		
< 20 or ≥35 years old	54	33,8
20 - 35 years old	106	66,2
<b>Parity</b>		
Primipara	64	40
Multipara	96	60
<b>Occupation</b>		
Housewife	97	60,6
Working mothers	63	39,4
<b>Level of Education</b>		
Lower level (Elementary and Junior High School)	45	28,1
Higher level (Senior high school, Diploma, and Bachelor degree)	115	71,9
<b>Monthly Income</b>		
Lower (≤Regency Minimum Wage)	42	26,3
High (>Regency Minimum Wage)	118	73,7
<b>Total</b>	<b>160</b>	<b>100</b>

Table 1 shows that most of the respondents of postpartum mothers aged from 20 to 35 were 89 mothers (66.2%). The group is categorized as at high risk for postpartum depression. The majority of postpartum mothers who gave birth to more than one child (multipara) were 96 (60%).

The majority of postpartum mothers were 97 housewives (63%). Their education level is mostly in high school (high school, Diploma 3, Bachelor's degree) and 115 people (71.9%). The majority of the respondents with an income above the Regency Minimum Wage were 118 mothers (73.8%).

Table 2. Confounding Variables of Postpartum Depression

Variable	frequency	%
<b>Husband Support</b>		
Poor	58	36.2
Good	102	63.8
<b>Family Support</b>		
Poor	47	29.4
Good	113	70.6
<b>Social Support</b>		
Poor	32	20
Good	128	80
<b>Marital Status</b>		
Married Living Together	136	85
Married Living Separately	24	15
<b>Planned Pregnancy</b>		
Unplanned	57	35.6
Planned	103	64.4
<b>Postpartum Depression</b>		
Not Depressed	129	35.6
Depressed	31	64.4
Total	160	100

Table 2 shows that most husbands gave good support, as reported by 102 mothers (63.8%). The support is in the form of psychological assistance, both in motivation, attention, and acceptance. Family support was mostly good, as reported by 113 people (70.6%). Likewise, with the social backing that 128 mothers (80%) said they received adequate support.

Among the respondents, 136 mothers (85%) were married and living together. This finding indicates that husbands' technical support to mothers is reasonable compared to those who live separately. The majority of mothers had planned pregnancies that were 103 mothers (64.4%). The majority of mothers did not experience postpartum depression as many as 129 mothers (80.6%), while 31 mothers experience postpartum depression (19.4%)

Table 3. Hypothesis Test Result of Determinant Factors of Postpartum Depression

Variable	B	SE	Wald	P-Value	Exp(B)=OR
Age	-0.676	0.833	0.659	0.417	0.509
Parity	0.022	0.766	0.001	0.977	1.022
Education Level	0.109	0.801	0.019	0.892	1.115
Occupation	2.167	0.865	6.279	<b>0.012</b>	8.728
Husband Support	2.334	0.912	6.553	<b>0.010</b>	10.320
Family Support	1.756	0.793	4.897	<b>0.027</b>	5.787
Social Support	1.739	0.774	5.050	<b>0.025</b>	5.693
Emotional Response	1.755	0.783	5.017	<b>0.025</b>	5.783
Intended Pregnancy	-0.842	0.922	0.834	0.361	0.431
Monthly Income	1.879	0.817	5.291	<b>0.021</b>	6.550

Table 3 shows that from the hypothesis test results obtained variables that influence postpartum depression are occupation ( $p = 0.012$ ), husband support ( $p = 0.010$ ), family support ( $p = 0.027$ ), social support ( $p = 0.025$ ), emotional response ( $p = 0.025$ ), monthly income ( $p = 0.021$ ). While the variables that did not affect postpartum depression were age ( $p = 0.417$ ), parity (0.977), education ( $p = 0.892$ ), and planned pregnancy ( $p=0.361$ )

Occupation has an OR (Odd Ratio) = 8.728, which means that a postpartum mother who works has a risk of 8.728 times to experience PPD than housewives or those who do not work. The value of OR husband support = 10.320, which means that postpartum mothers who lack support from their husbands have a risk of 10.320 times to experience PPD than those housewives who get good support from their husbands.

OR value of family support = 5.787, which means postpartum mothers who lack family support has a risk of 5.787 times to experience PPD than those who get good family support. The OR value of social support = 5,693, can be interpreted that postpartum lack of social support has a risk of 5,693 times to experience PPD than those who get good social support.

OR Obstetrics = 5,783 means that postpartum mothers whose births were not planned have a risk of 5,783 times more likely to experience PPD than intended. A low economic status OR value = 6,550 means that postpartum mothers who have an income below the UMK (Regency Minimum Wage) are at risk of experiencing PPD of postpartum mothers who have an income above the MSE.

## Discussion

In this study, the age range of 20-35 years is the most optimal reproduction where the mother's physical, mental, emotional, and intellectual health status is ready to get pregnant, give birth, and care for the baby. In contrast, younger mother or older mother have a higher risk to develop PPD (18,34).

Multiparous women have previous pregnancy and childbearing experiences. This experience means that mothers have considered the risks and role changes that occur during the postpartum process regarding the domestic and emotional burden. Previous experience can make a mother able to carry the duty as a mother to her baby and reduce the risk of postpartum depression. The number of pregnancies is not directly associated with postpartum depression. In study stated that multiple pregnant women might be more susceptible to postpartum depression than singleton mothers (35,36). In contrast to this study findings, in Japan, it became clear that the risk of PPD is significantly higher for primiparous than multiparous (37-39).

A study found no relationships between maternal educational levels and PPD (21). In this study, most respondents' education level belonged to the higher education level but not graduate from the health sector nor the maternal health or psychology degree. This condition resulted in a low level of knowledge about maternal health and its psychological aspects. They do not understand the incidence, causes, symptoms, prevention, and treatment of postpartum depression. A high level of education does not affect the respondents' knowledge of maternal and psychological health. Therefore, the level of education is not a risk factor for postpartum depression.

In this study, the educational level of the mothers is not related to PPD. Another study found no statistically significant difference between the mother's educational status and PPD (40). According to some studies, PPD risk increased when the educational level was higher (41). Another study found no correlation (29,34,42-46), 46.2% of the studies indicated that the mothers' educational status correlated with PPD.

Mothers who have an occupation is associated with PPD. After three months of maternal leave, mothers have to work for economic reasons. Mothers usually work for 8 hours a day. After returning home, feeling tired and having to care about the babies and domestic workload increases the exhaustion level that resulted in depression. Other studies found that the correlation between mothers' working status and depression differs. It was found that non-working mothers in central Turkey and working mothers in Western Turkey had increased PPD frequency (47-49). Of note, women who returned to work for economic reasons had more PPD (48,50,51). The studies examined showed working status was a significant factor affecting (33.3%) PPD.

Housewives can focus more on carrying out their roles as mothers during the postpartum period. Being a housewife can also accompany the baby's growth and development well without losing one moment than working mothers whose time is divided by work where the average working mother is in their workplaces for 7-8 hours every day.

In this study, the husbands' support analysis resulted in OR 10.320, which signifies respondents who received high husbands' support had a 10.320 times lower risk of postpartum depression. The supports needed by mothers are emotional, instrumental/domestic household, appreciation, and postpartum information aspects.

The husband's support influences the incidence of postpartum depression. Lack of husband support will increase the risk of postpartum depression in postpartum mothers. Another study found that the husband's support affects low postpartum depression. There was a negative relationship of -0.842 between the husband's support and postpartum depression in that study. The negative relationship means that the higher the husband's support for his wife after giving birth, the lower the postpartum depression. Husbands' support is one of the factors that can influence the emergence of postpartum

depression in women after childbirth (52). Conversely, the lower the husbands' support, the higher the postpartum depression in women after childbirth.

Family support reduces the emotional burden and activities related to baby care and self-care, which requires a lot of time and energy. The family provides mental support by being willing to be a place to tell the burden of his mind and be a place to ask when there are things that are not understood about childbirth and baby care. The family also supports household chores such as cleaning the house, helping to wash baby diapers, providing food for the mother during childbirth, and delivering if the mother has to go for examination and immunization of the baby.

In line with the results of this study, a study examined the relationship between perceived social support and self-esteem find that social support, especially by families, dramatically influences the development of self-esteem and self-ability, and social support plays an essential role in health, mental progress and quality improvement (53), family support provides a significant effect to reduce the incidence of postpartum depression (54).

A high level of perceived social support decreases the level of PPD. Mothers who have low social support have an increased risk of PPD 5.693 times higher than those with high perceived social support. A study stated an inverse relationship between social support with PPD after adjusting the confounding variable such as depression history, infant health problems, and medication consumption during pregnancy (55).

Two aspects of social support in strengthening maternal self-esteem and willingness to be relied upon are strongly associated with depression and anxiety in the first eight months postpartum. Likewise, a study states that social support and postpartum depression have a close relationship. A woman with little social support, poor health, and high stress tend to be depressed (56). Forms of support provided by the community, such as visiting postpartum mothers, are willing to give mothers the information needed during the postpartum period. The society invites postpartum mothers to continue participating in community activities such as religious activity or neighborhood meetings.

In this study, mothers' emotional response to their infants after birth is associated with an increased risk of PPD. Mothers who are happy and accepting their infant characteristics have a low level of PPD. Mothers who are not satisfied with their infant experience PPD. A positive emotional response is closely related to adequate maternal-infant bonding that directly affects the occurrence of PPD (57).

In the previous research studying the relationship between unintended pregnancy and postpartum depression has generally found a higher likelihood of postpartum depression among mothers with unintended and unwanted births (58). In this study, a woman with an unintended pregnancy was not directly associated with PPD.

Another study in Pennsylvania found that unintended pregnancy is not directly associated with PPD, but PPD highly happens to mothers who have unintended pregnancies (59). is likely because characteristics associated with higher rates of unintended pregnancies (younger age, non-white race, unmarried, prepregnancy anxiety/depression) were also associated with postpartum depression. Thus, while women with unintended pregnancies were more likely to be experiencing postpartum depression, it was not independent of these baseline characteristics.

Most mothers have a family income above the regencies minimum wage, which means that they can meet the increased living needs for babies and postpartum mothers' care. Adequate basic requirements enable mothers to perform optimally to care for their babies. In fulfilling the needs of the baby, mothers must first fulfill their basic needs. The mother's first need balanced nutritious food, vitamin and mineral supplements, mother and baby clothing, recreation before the mother provides care for her baby. If the mothers can meet their basic needs, then the mothers are physically, mentally, emotionally in good status and can adapt to health.

A study about mental health in the community revealed that only 17.6% (18 out of 102 respondents) had an excellent mental health experience (31). This low percentage of women's literature on mental health means that only the minority of the community understands mental health. The consequences of that are the poor attitude towards those in need (32).

Low economic status related to depression in 3 months postpartum where the family (60,61). in this study, monthly family income associated with postpartum depression occurred in 8 weeks of postpartum. Low family income causes problems in meeting the needs of mothers and infants during postpartum. Family needs are related to proper and balanced nutrition, new clothing, and health care that needs more funding than family needs before pregnancy and childbirth. In Sukoharjo, most family has low to middle income. Families are not prepared to save money before pregnancy. They usually save money when the pregnancy occurs, and it can only funding for basic needs during pregnancy, childbirth, and the postpartum period. Among mothers with low monthly income, depression happens because of the difficulties of fulfilling infants' and mothers' needs.

## Conclusion

Factors associated with postpartum depression are occupation ( $p = 0.012$ ), husband support ( $p = 0.010$ ), family support ( $p = 0.027$ ), social support ( $p = 0.025$ ), emotional response ( $p = 0.025$ ), monthly income ( $p = 0.021$ ). While the variables that did not affect postpartum depression were age ( $p = 0.417$ ), parity ( $0.977$ ), education ( $p = 0.892$ ), and planned pregnancy ( $p=0.361$ )

Recommendation: Postpartum depression occurrence are more related to the support to mothers from husband, family, social, financial, that can be prevented by education about postpartum depression among husband, family, and society. A program PPD management program focussing on prevention and intervention in maternal mental health is needed by the cooperation between health agencies, health professionals, and community through first, second, and third prevention. Education on postpartum depression for premarital couple and pregnant mothers are highly recommended.

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