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*Case Study*

# Depression and Anxiety as Mental Health Disorders That Affect Pregnancy: A Case Study in Surakarta, Indonesia

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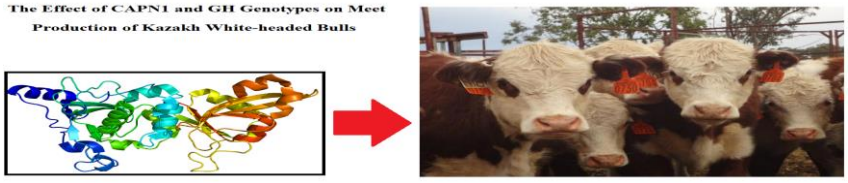
**ABSTRACT**

Obstetric characteristics of pregnancy and the reproductive process are related to the susceptibility of pregnant women to mental health problems. This study aims to analyze the relationship between obstetric characteristics and antenatal depression during symptoms among pregnant women in Surakarta. The observational studies were conducted using a cross-sectional design to describe the symptoms of antenatal depression. A sample of 150 pregnant women was recruited from selected health centers using random cluster sampling in Surakarta, Central Java, Indonesia. Data were collected using a biographies characteristics questionnaire. The scale of depressive symptoms during pregnancy was measured using the Edinburgh Postpartum Depression Scale (EPDS) questionnaire in Indonesian, which was validated and proved reliable in previous studies. Pregnant women filled out the questionnaire independently after completing ANC services. To analyze the data, chi-square test and logistic regression analysis were computed. The results showed that poor obstetric history experienced by pregnant women has a significant role in antenatal depression (p-value 0.021) OR: 3.071 (95% CI: 1.187 - 7.947). This means that a poor obstetric history is three times more likely to develop depression during pregnancy. Unplanned pregnancy variables affect antenatal depression symptoms. The logistic regression analysis showed that planned pregnancy could prevent depression three times (p-value 0.011), OR: 0.339 (95% CI: 0.147 -0.784). Unplanned or unwanted pregnancy and poor obstetric history were the dominant factors affecting antenatal depression symptoms. An unplanned pregnancy affected readiness for adjustment during pregnancy. Also, poor obstetric history left unpleasant experiences, which could create psychological conditions for subsequent pregnancies.

**GRAPHICAL ABSTRACT**

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## Introduction

Depression is a type of mood swing that causes discomfort and loss of appetite. Women are twice as likely as men to be depressed, and women of childbearing age are more likely to be depressed [1-3]. Some pregnancy symptoms are similar to depressive symptoms. These symptoms include changes in sleep, changes in energy levels, appetite, and sexual desire [4]. As a result, it is more likely that such symptoms are due to pregnancy than to depression. Many women may be reluctant to talk to their doctor about certain mood swings during pregnancy [5, 6]. Mental health is one of the global health problems, which greatly supports and affects an individual's physical health. Good mental health conditions are closely related to mental and psychological well-being. Depression is a common mental health disorder [7–9]. Persistent sadness, loss of interest in engaging activities, and inability to carry out daily routine activities for at least two weeks are signs of depression [10].

Nowadays, the global community pays great attention to depression and mental health problems as this mental health disorder may affect physical health conditions [11, 12]. According to World Health Organization (WHO), globally, depression in women (4.6%) is higher than that of men (2.6%) [10]. The available data of depression in pregnant women in low-income countries vary from 10% to 41.2%, and the rate in postpartum women ranges from 14% to 50% [13–16]. The proportion of anxiety disorders in the global population in 2015 was estimated to reach by 3.6%. Recent data show that about 10% of pregnant women worldwide and 13% of women who have just labored experience mental disorders, especially depression. Data in developing countries is even higher, by 15.6% during pregnancy and 19.8% postpartum [17, 18].

In Indonesia, the data of emotional mental disorders in general, such as anxiety disorders and depression, is 11.6% of the adult population. These data are still limited because there is no specific data related to mental disorders in pregnant women [19]. In 2013, the prevalence of mental disorders soared to 6% [20]. Specific data on depression in pregnancy in Indonesia are not available; however, several studies have discovered a rate of 14% [21].

Pregnant women experience physical changes, followed by psychological changes that result in emotional instability. Pregnancy is an increased vulnerability to developing anxiety and depression [22]. Unstable emotional changes impact fetal development, preterm birth, LBW (Low Birth Weight), and the baby's emotional state after birth [23–25]. Pregnant women are often unaware that they are experiencing mental disorders, especially depression. Often husbands and families cannot identify the unstable psychological condition of pregnant women, so they leave pregnant women with not enough attention and support. It accordingly can lead to depression symptoms in pregnant women that remain untreated and can worsen until the puerperium and cause baby blues and even postpartum depression [26]. This study therefore aimed to analyze the relationship between characteristic obstetric factors, namely maternal age, gestational age, Gravidity, Parity, Obstetric History, and antenatal depression symptoms in pregnant women in Surakarta.

## Materials and Methods

This observational study was conducted with a cross-sectional design. The population of this study was pregnant women who attended ANC at the community health centers in Surakarta. The sample of this research was several pregnant women who met the inclusion criteria and were taken as samples. The criteria included pregnant women who attended ANC at the Surakarta community health center, a minimum of 12 weeks of gestation, singleton pregnancy. The number of pregnant women as a sample was determined using the sample size for the cross-sectional study taken from the Lemeshow formula [27]. 10% of the sample size was added so that the sample taken was 147.8 (rounded 150) to anticipate the occurrence of dropout. The sampling technique was performed using the cluster random sampling technique, in which pregnant women who met the inclusion criteria of the chosen community health centers were selected as samples. The research was conducted

in outpatient service in all community health centers (Puskesmas) in Surakarta, in Manahan, Gambirsari, Gilingan, Kratonan, Sangkah Nusukan, Purwodiningratan, Ngoresan, Jayengan, and Purwosari.

The data were collected using questionnaires filled out directly by respondents once they attended pregnancy examinations at community health centers. Among pregnant women attending the selected community health center, those who were willing to participate in the study were asked to sign the informed consent. Pregnant women who were willing to involve completed data filled out questionnaires in the waiting room ANC service. Each respondent filled out the Indonesian version of the Edinburgh Postpartum Depression Scale (EPDS) depression symptom questionnaire, whose validity and reliability has been reported by previous researchers. Then, the collected data were analyzed using the chi-square test with statistical software SPSS IbM 22.

## Results and Discussion

This research was conducted in 13 outpatient health centers in Surakarta. Based on educational characteristics, as many as 91 (60.7%) pregnant women had a high school educational level. However, some pregnant women only graduated from elementary school, with eight respondents (5.3%). Most of the mothers were unemployed or housewives, by 67.3%. They worked at houses, either as a tailor, in household food industries, or selling goods from their houses.

**Table 1:** Demographic and obstetric characteristics of pregnant women in outpatient service in community health centers in Surakarta

| Demographic Characteristics | n=150 (%) |
|---|---|
| Maternal age (y.o) | |
| < 20 | 4 (4.0) |
| 20-35 | 129 (86.0) |
| >35 | 15 (10.0) |
| Education | |
| Elementary | 8 (5.3) |
| Junior High | 28 (18.0) |
| Senior High | 91 (60.7) |
| Undergraduate | 24 (16.0) |
| Occupation | |
| Housewife/Unemployed | 101(67.3) |
| Work at house | 12 (8.0) |
| Employee | 37 (24.7) |
| Obstetric characteristics | n=150 (%) |
| Gestational age | |
| First-trimester | 26 (17.3) |
| Second-trimester | 44 (29.3) |
| Third-trimester | 80 (53.3) |
| Gravidity | |
| Primigravida | 55 (36.7) |
| Multigravida | 95 (63.3) |
| Parity | |
| Nullypara | 57 (38.0) |
| Multipara | 93 (62.0) |
| Obstetric Complication History | |
| Yes | 23 (13.3) |
| No | 127(86.7) |
| Pregnancy Plan | |
| Unplanned | 34 (22.7) |
| Planned | 116(77.3) |
| Depression Symptom | |
| No (EPDS <12) | 112 74.7) |
| Yes (EPDS ≥ 12) | 38 (25.3) |

The average age of pregnant women was 28.21 ± 5.25 years. The youngest pregnant women's age was 17 years, and the oldest was 42 years old, who were both included in the high-risk

pregnancy group. Maternal age classified as high risk in the young group was 4%, and the high-risk group in the old group was 10%. Table 1 describes the demographic and obstetric characteristics of pregnant women in detail.

More than half (53.3%) were in the third trimester of pregnant women's characteristics related to the pregnancy condition. The average gestational age was 24.8 ± 9.84 weeks. The youngest gestational age of the respondents was four weeks, and the oldest was 38 weeks before the due date. More than one-third were on first pregnancy (36.7%), and about 13.3% had an obstetric complication history. Less than a quarter of respondents (22.7%) did not plan their pregnancy. Based on the EPDS questionnaire measurements, 47.4% of respondents experienced depression symptoms (EPDS> = 12).

**Table 2:** Multivariable analysis of obstetric characteristics of antenatal depression symptoms

| Variable | Depression Symptom | | p-value | RP | 95% CI |
|---|---|---|---|---|---|
| | Yes | No | | | |
| Maternal age (y.o) | | | | | |
| < 20 | 1 (20.0) | 5 (80.0) | 0.133 | 0.29 | 0.049 - 1.770 |
| 20-35 | 73 (86.0) | 56 (43.3) | Ref | | - |
| >35 | 5 (35.0) | 10 (65.0) | 0.1508 | 0.58 | 0.283 - 1.224 |
| Gestational age | | | | | |
| First-trimester | 13 (50.0) | 13 (50.0) | 0.93 | 1.048 | 0.639 - 1.716 |
| Second-trimester | 21 (47.8) | 23 (52.2) | Ref | | |
| Third-trimester | 45 (56.2) | 35 (43.8) | 0.47 | 1.179 | 0.818 – 1.697 |
| Gravidity | | | | | |
| Primigravida | 9 (16.3) | 46 (83.7) | 0.084 | 1.204 | 1.008 - 1.437 |
| Multigravida | 29 (30.5) | 66 (69.5) | | | |
| Parity | | | | | |
| Nullypara | 8 (14.0) | 49 (86.0) | 0.022* | 0.435 | 0.215 – 0.882 |
| Multipara | 30 (32.3) | 63 (67.7) | | | |
| Obstetric Complication History | | | | | |
| Yes | 11 (47.8) | 12 (52.2) | 0.015* | 2.25 | 1.308 – 3.870 |
| No | 27 (21.3) | 100 (78.7) | | | |
| Pregnancy Plan | | | | | |
| Unplanned | 15 (44.1) | 19 (55.9) | 0.008* | 1.435 | 1.050 – 1.960 |
| Planned | 23 (19.8) | 93 (80.2) | | | |

The analysis results of the relationship between obstetric and depression symptoms during pregnancy variables showed that one respondent (20.0%) out of five pregnant women aged <20 years experienced depression. Meanwhile, in the high-risk age group of pregnant women above 35 years old, five respondents (35.0%) out of 15 pregnant women had experienced depressive symptoms. However, in general, there was no relationship between maternal age and depression symptoms during pregnancy. The statistical test results showed no relationship between early gestational age and pregnancy depression (p-value 0.93). Likewise, there was no relationship between late gestational age and depression symptoms (p-value 0.7).

In Table 2, given the characteristics of gravidity, in the primigravida group (first pregnancy), nine respondents (16.3%) out of 55 experienced depressions during pregnancy whereas in multigravida pregnancies, second pregnancies, and so on, 30.5% of samples experienced depression symptoms. Statistically, there was no relationship between gravidity and depression symptoms during pregnancy (p-value 0.084).

For pregnant women with nullipara (who has never given birth), there were 8 (14%) out of 57 pregnant women experiencing depression during pregnancy. Nullypara does not directly denote that it is the first pregnancy, but it may be the second or third pregnancy but had had bad obstetric history at the beginning, such as abortion or miscarriage. The statistical test

results concluded that there was a relationship between parity and depression symptoms during pregnancy (p-value 0.022). Nullypara (who has never given birth) was more likely to prevent depression during pregnancy by 0.435 (95% CI: 0.215 - 0.882). In other words, multipara is 2.29 times more likely to experience depression during pregnancy.

Regarding the obstetric history conditions that had been experienced, 11 pregnant women (47.8%) had had bad obstetric histories and later experienced depression symptoms in their present pregnancy. Meanwhile, most of the pregnant women without poor obstetric history (78.8%) did not experience depression symptoms during pregnancy. Poor obstetric history included abortion with 13 (56.5%), LBW with 5 (21.7%), and stillbirth with 3 (13.0%). There was a statistically significant relationship between obstetric history and depression symptoms during pregnancy (p-value 0.015). Pregnant women with poor obstetric history have 2.25 times the risk for depression symptoms (95% CI: 1.308 - 3,870) than those with no poor obstetric history.

These results show that 34 pregnant women admitted that their pregnancy was unplanned or unwanted. Of these unplanned pregnancies, there were 15 respondents (44.1%) experiencing depression symptoms during pregnancy. While the majority (80.9%) of planned pregnancies, respondents did not experience depression symptoms during pregnancy. The results of hypothesis testing revealed that there was a statistically significant relationship between unwanted or unplanned pregnancy and depression symptoms during pregnancy (p-value 0.008). Pregnant women with unplanned/unwanted pregnancies are 1.4 times more likely to develop depression symptoms than those with planned pregnancies.

Based on the results of multivariate analysis, the variable that most contributed to the occurrence of depression during pregnancy was bad obstetric history (p-value 0.021) exp B: 3.071 (95% CI: 1.187 - 7.947), meaning that bad obstetric history has three times greater risk of depression during pregnancy. Likewise, unplanned pregnancy affects the symptoms of pregnancy depression. The logistic regression analysis results showed that planned pregnancy could prevent depression by three times (p-value 0.011), Exp B: 0.339 95% CI: 0.147 -0.784).

Obstetric characteristics are a condition of women related to the pregnancy process, including maternal age, gestational age, gravidity, parity, obstetric history, and pregnancy plans. The parity factor indicates the number of children born and alive at the time of the study. In the bivariate analysis, parity was shown to be statistically associated with depression symptoms during pregnancy, where nullipara (has never given birth) was a preventive factor for depression. This, however, is still inconsistent with previous studies. The results of a systematic review [22] displayed that parity and gravidity were inconsistent variables for depression during pregnancy. Some studies provide information that multipara increases the risk of depression and anxiety during pregnancy [28]. However, others conclude that nullipara or primipara had a greater risk of depression during pregnancy. Likewise, in the number of pregnancies (gravidity), some researchers have found multigravida as predictors of depression during pregnancy, but other studies have concluded there is no relationship between gravidity and depression during pregnancy [22]. Following multivariate analysis, the parity variable was outperformed by the bad obstetric history and unplanned pregnancy variables, which were more dominant, as the indications of the occurrence of depression symptoms during pregnancy.

Poor obstetric history is a significant risk of depression symptoms during pregnancy [29]. One of the worst obstetric histories is pregnancy loss (abortion). The pregnancy loss occurs at a time of expecting a new life, the loss of an unborn child. This is consistent with a study in Brazil in which women with abortion histories, fetal death, preterm birth, and stillbirth had greater symptoms of anxiety and depression in subsequent pregnancies, leading to a long-term effect on the quality of life [30]. In this study, there were 47.8% of pregnant women with poor

pregnancy histories experienced depression symptoms during pregnancy. These results are supported by previous studies in Ghana in which one of the other determinants of depression during pregnancy was the loss of previous pregnancies (abortion history) [31]. Previous studies in Ethiopia have also concluded that obstetric complications, namely abortion history, stillbirth history, and the current pregnancy complications, are the main determinants of depression during pregnancy [32].

Unwanted or unplanned pregnancy is a dominant factor in depression during pregnancy and increases the risk of postpartum depression in women [33]. Fadzil's research corroborates in Malaysia, reporting that unwanted pregnancy occur due to young and risky age marriage of women or at an old risk age of women who give birth to two or three children and do not want any child yet do not use contraception [34]. Women with unplanned pregnancies are three times more likely to have depression symptoms than those with planned pregnancies [35]. Apart from being a risk factor for depression during pregnancy, unwanted pregnancy has an important role in the occurrence of postpartum depression as a precursor [36].

The results of this study are also consistent with those of Weobong on a population of rural women in Ghana, reporting unplanned pregnancy is a determinant factor for depression during pregnancy. In Weobong's study, women were usually constrained in determining their reproductive health, so they could not plan pregnancy. Unplanned pregnancy is characterized as an important role in decision-making in women's mental well-being [31]. A study in Manisa, Turkey, shows that women with unplanned pregnancies had a higher risk of depression shown in the Beck Depression Inventory (BDI) score than women with planned pregnancies [37]. In that study, women with unplanned pregnancies had higher depression scores and exhibited poor health practices during pregnancy. Because they did not understand or were reluctant to do prenatal care, the antenatal care was performed slower. According to Britain, unplanned pregnancy is also an important predictor of pregnancy depression [38]. A planned pregnancy assures women in preparing for pregnancy and planning childbirth so that they are more confident in adjusting to any changes and maintaining a balance of their needs [39, 40].

## Conclusions

The obstetric variables that had the most dominant influence on depression during pregnancy were bad obstetric history and unplanned pregnancy. Obstetric history leaves unpleasant impressions and experiences, which may influence the psychological condition of subsequent pregnancies. Unplanned or unwanted pregnancies cause women to be less prepared to face and undergo physical and psychological changes while adjusting to each change.

Screening to detect depression during pregnancy needs to be performed routinely at the community health center to identify risk factors for obstetric complications. Reproductive health education, especially pregnancy planning, needs to be improved to prevent unwanted pregnancy that may lead to depression during pregnancy.

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## Authors' contributions

All authors contributed toward data analysis, drafting and revising the paper and agreed to responsible for all the aspects of this work.

## Conflict of Interest

We have no conflicts of interest to disclose.

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