



## Research Article

# Prevalence of and Risk Factors for Depressive Symptoms in Korean Women throughout Pregnancy and in Postpartum Period



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## SUMMARY

**Purpose:** Prenatal depression is a significant predictor for postpartum depression. However, there is a lack of research on risk factors for Korean women related to prenatal depression and the relationship between prenatal depression during the three trimesters and postpartum depression. Therefore, aims of this study were (1) to identify the prevalence of depression during all three trimesters and the postpartum period, (2) to evaluate the relationship between prenatal depression in each trimester and postpartum depression, and (3) to identify the relationship and differences in prenatal depression based on sociodemographic factors in Korean women.

**Methods:** One hundred and fifty three Korean women were recruited from three maternity clinics in Korea. Prenatal and postpartum depressions were evaluated in the first, second (24–26 weeks), third (32–34 weeks) trimester and 4 weeks postpartum with the Edinburgh Postnatal Depression Scale–Korean. **Results:** The prevalence of depression in the prenatal and postpartum period ranged from 40.5% to 61.4%. Depression in the second and the third trimester was significantly correlated with depression in the postpartum period. Unemployment and household income were risk factors for prenatal depression in the first and second trimesters.

**Conclusions:** To assist women suffering from postpartum depression and prevent its effects, women should be screened for prenatal depression during all three trimesters. For Korean women with high risk factors for prenatal depression, we suggest that the Korean government establish healthcare policies related to depression screening as routine prenatal care and mental health referral systems.

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## Introduction

Pregnancy can increase the vulnerability of mental, physical, and psychological health of women and their fetuses [1]. It is well-known that maternal depression or depressive symptoms during pregnancy are a significant predictor of postpartum depression in women and has been shown to have increased negative effects on infant outcomes [2–4].

The timing of prenatal depression is also important for birth and infant outcomes. For example, the timing of maternal depression and depressive symptoms during pregnancy impacts the neuro-behavioral development of the fetus and has been linked to developmental, behavioral, emotional, and cognitive problems in

infants and children, including preterm delivery, low birth weight, increased negative reactivity, attention regulation, anxiety, and depression [2,3,5,6]. However, there is a lack of studies regarding the relationship between timing of prenatal depression and postpartum depression. One study with Chinese women showed that depression in the first trimester was a powerful predictor of postpartum depression [7]. We do not know at which point of prenatal depression healthcare providers or clinicians need to assess prenatal depression to prevent postpartum depression. A timely detection of prenatal depression should be investigated in a systematic way to prevent adverse outcomes for mothers and infants.

Many researchers have used the terms depression and depressive symptoms interchangeably. The concept of depression was used widely to mean depressive symptoms, even though depression criteria is defined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) [2,3,7,8]. However, maternal depression and depressive symptoms during pregnancy have shown negative infant and maternal outcomes [2–4].

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The prevalence and incidence of prenatal depression in each trimester must first be identified. However, an accurate estimate of the prevalence and incidence of prenatal depression is uncertain because assessment methods, the timing of assessment, and population characteristics vary widely [9]. In a systematic review with meta-analysis, the estimated prevalence of prenatal depression is 11.0% in the first trimester and 8.5% in the second and third trimesters in England, Scotland, Norway, Portugal, Netherland, Australia, United States, Canada, Hong Kong, and Japan. Approximately 14.5% of pregnant women have a new episode of depression during pregnancy [9]. In a systematic review, prenatal studies with a clinical assessment or structured clinical interview were included to identify clinical depression. However, no studies investigating prenatal depression in Korean women were included in that review because no studies with a structured clinical interview have been done on that topic with Korean women.

Although prenatal depression is more prevalent than postpartum depression [2,6], research on prenatal depression is more limited compared to postpartum research in Korea and other countries. Recently, prenatal depression has become a topic of interest among Korean researchers and clinicians because of its ability to predict postpartum depression, which has become an important social issue in Korea. Korean research on prenatal depression is in its early stages compared to that of other countries [10]. In addition, national data are not available in Korea regarding the prevalence and incidence of prenatal depression in each trimester or regarding the relationship between prenatal depression in each trimester and postpartum depression.

The reported prevalence of prenatal depression or depressive symptoms in Korea has varied broadly because of the use of different tools and the timing of the assessment. Published estimates of the prevalence of prenatal depression among Korean women ranged from 20.0% to 44.0% using either the Beck Depression Inventory (BDI) or Edinburgh Postnatal Depression Scale–Korean (EPDS-K) [10,11–15].

Korean researchers have measured depression once during the prenatal period [10,16,17] or evaluated depression once in the prenatal and once in the postnatal period [15]. However, no study has examined the relationship between prenatal depression during the three trimesters and postpartum depression in Korea. Therefore, we do not know the relationship between the timing of depression during pregnancy and postpartum depression. In addition, because of the scarcity of longitudinal studies that measure depression during the three trimesters and postpartum period in Korea, we do not know the prevalence of perinatal depression during each trimester and postpartum period or the change in patterns of perinatal depression during that time.

To identify women at high risk for prenatal depression, research studies investigating sociodemographic factors that influence prenatal depression are needed. In a systematic review regarding risk factors for depressive symptoms during pregnancy, a history of depression, lower income, lower education, smoking, and single status were related to prenatal depression in western countries including Australia, Canada, England, Finland, Germany, Netherlands, Norway, Sweden, and the United States [18]. In a review study of prenatal depression of women in East Asia including China, Japan, Korea and Taiwan, younger age, smoking, low education, income and unemployment were risk factors of prenatal depression [19].

Limited and inconsistent information for risk factors of prenatal depression is available in Korea. Sociodemographic factors such as age, marital status, educational level, job, socioeconomic status, parity, number of children, smoking, and alcohol consumption are associated with prenatal depression [12]. However, the factors identified by Kim and Ryu [12] did not significantly correlate with

prenatal depression in other Korean studies [10,11]. Another Korean study showed that income, health status, marriage satisfaction, family support and husband's love were risk factors for prenatal depression [17]. Hence, more research is needed to adequately explore the factors that impact prenatal depression in Korean women to prevent women with risk factors for prenatal depression from developing postpartum depression. Therefore, the aims of the current study were (1) to identify the prevalence of depression during all three trimesters and the postpartum period, (2) to evaluate the relationship between prenatal depression in each trimester and postpartum depression, and (3) to identify the relationships and differences of prenatal depression based on socio-demographic factors in Korean women.

## Methods

### Design

This was a longitudinal design study [20]. It involved the same participants with a repeated measure survey of four data collection points during the three trimesters of pregnancy and the postpartum period.

### Setting and sample

Based on the results from a previous study [16], the prevalence of depression among pregnant women is approximately 8.0% in Korea. Based on a sample size calculation with 8.0% as the null and to detect a minimum difference in prevalence of 4.0%, the study required 200 participants with a power of 82.3% and a significance level of 0.05. The pregnant women were recruited from three maternity clinics in Gwangju in Korea. The three maternity clinics were chosen because the directors of the clinics were willing to participate in the study and the clinics have good reputations in terms of quality of care. The three maternity clinics also had similar demographic characteristics. The inclusion criteria for the participants were as follows: (1) aged 18 years and older; (2) gestational age  $\leq 14$  weeks (first trimester); (3) able to speak, read, and write Korean; and (4) able to cooperate with data collection methods. The exclusion criteria included a gestational age  $> 14$  weeks; a limited ability to read, speak, and write Korean; or those under 18 years of age.

### Ethical considerations

Approval for the study was granted by the institutional review board of the Chosun University (IRB-10-014). Participation was voluntary. Participants' responses were kept confidential by using a study identity number or participant code for each survey.

### Measurements

The data collection methods included the following: (a) a sociodemographic questionnaire and (b) EPDS-K, 10-items.

A sociodemographic questionnaire was used to describe the sample characteristics. It asks basic sociodemographic questions including the following: nationality, gestational age, estimated delivery date, age, educational level, marital status, number of children, nulliparous or multiparous status, employment status, household income level, history of depression, existing disease, present smoking status, and alcohol consumption.

The EPDS was developed to measure depressive symptoms in women in the postpartum period [21]. The self-reported questionnaire comprises 10 items rated on a 4-point scale, from 0 to 3, with a higher score indicating a higher level of depression. It

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