

A Cross Sectional Study of Predictors of Antenatal Depression in Unmarried Korean Pregnant Women Receiving Shelter Services

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Abstract

This study aimed to explore the predicting factors of antenatal depression in unmarried pregnant women. A total of 137 unmarried pregnant women receiving shelter services from 20 welfare facilities in Korea were invited to participate in this study. Social support, self-esteem, and antenatal depression were assessed using structured questionnaires. Antenatal depression was measured using the Edinburgh Postnatal Depression Scale. Participants were divided into two groups based on EPDS scores (Depression = greater than 10, Not Depression = 9 or less). Bivariate logistic analysis was used to identify predicting factors of antenatal depression. Results showed that significant predictors of antenatal depression were a history of childbirth, informational support, evaluation support, and self-esteem. These findings need to be considered when developing interventions for unmarried pregnant women that focus on prevention and management of antenatal depression.

Keywords: *Antenatal depression, Unmarried mothers, Social support, Self-esteem*

1. Background

1.1. Introduction

Pregnancy is a developmental milestone in the female life cycle. However, pregnant women may experience negative emotional changes, such as depression, if they fail to overcome physical, emotional, and social changes related to pregnancy. The prevalence of antenatal depression in the United States is 5–15% [1, 2]. The incidence of antenatal depression in Korea is 26–36% [3-5]. In addition, compared to the incidence of postpartum depression in Korea (10–28% [5, 6]), the incidence of antenatal depression is very high.

Antenatal depression can affect both the fetus and mother. It has been linked to adverse pregnancy outcomes such as premature birth, still birth, low birth weight, and preeclampsia [7]. In addition, antenatal depression is a strong predictor of postnatal depression in women [8]. Development of depression during the 3rd stage of pregnancy in primigravida is strongly related to postnatal depression in the first three months [9]. Moreover, pregnant women who experience antenatal depression are five to six times more likely to experience postnatal depression compared to other pregnant women [10].

For pregnant women, antenatal depression is an impediment to achieving a maternal role. Higher depression levels are associated with lower maternal-fetal attachment [11, 12]. Acquisition of maternal-fetal attachment for pregnant women indicates the beginning of the maternal role [13], and because maternal-fetal attachment acquisition is related to maternal-infant attachment [14], this attachment plays an important role in positive birth outcomes.

Hormone changes induced by pregnancy and many other factors contribute to the development of antenatal depression. Development of antenatal depression in pregnant women is related to their age, income, education level, marital status, depression history,

drinking, smoking, and social support including family support, and self-esteem. In particular, individuals who seek social support within the community are better able to handle crises, and therefore experience less stress and depression compared to those who do not look for support in their environment [15]. In addition, social support from family and friends is an important factor for mental health in pregnant women who are in a development crisis phase. According to previous studies, expectant women who do not have satisfactory spousal support have higher levels of depression than those who have satisfactory spousal support [11, 16]. Mercer *et al.*, [17] proposed a theoretical model suggesting that as individuals' perception of social support decreases, self control decreases. This chain leads to an increase in depression. In addition, self-esteem is an affective predictor of antenatal depression. Pregnant women with high self-esteem have lower levels of antenatal depression [18], and because they view pregnancy as their most valuable life event, they effectively revalue and overcome pregnancy-induced stress and depression [19].

This background suggests that unmarried pregnant women are more likely to experience antenatal depression than married pregnant women. Unmarried pregnant women hide their pregnancy because of negative views from society or because they do not receive support from their families because of guilt, criticism, and severance from their families. Furthermore, unmarried pregnant women may be excluded from social and emotional support and information because they are branded as having a disorderly sex life. Perceived level of postnatal social support is lower in unmarried versus normal pregnant women [20]. An investigation of the degree of social support from different sources revealed that unmarried pregnant women have the lowest perceived level of support from their partner [21].

Unmarried pregnant women's self-esteem is related to negative emotions such as self criticism due to society's negative views, adoption or parenting decisions, economical problems, and severance from peers [22]. Unmarried pregnant women with low self-esteem are vulnerable to negative effects of stress due to pregnancy, and because they cannot handle stress appropriately, they are more likely to suffer depression [19]. In the long term, pregnant women's self-esteem is related to postnatal depression [23].

As reviewed above, research investigating the prevalence of depression in unmarried pregnant women and the predictors of antenatal depression in this population is needed. This research will be an important tool for policies and nursing interventions to prevent antenatal depression and positive birth outcomes. Unfortunately, research on unmarried pregnant women to date has only managed to propose relationships between health promotion and depression [20], social support and self-esteem [24], and facility depression and social support [21]. There have not been any are no studies that take both social support and self-esteem into consideration.

Therefore, the aim of this study was to determine the prevalence of depression in unmarried pregnant women, and identify factors that predict antenatal depression. Furthermore, this research will provide base data for nursing interventions for preventing and managing prepartum depression in unmarried pregnant women.

1.2. Purpose

The purpose of this study is to explore predictors of antenatal depression in unmarried pregnant women.

2. Methods

2.1. Study Design

This was a descriptive cross-sectional study that used self-report questionnaires.

2.2. Participants and Procedure

A total of 137 unmarried pregnant women receiving shelter services from 20 welfare facilities in Korea were invited to participate in this study from January 12, 2015 to May 20, 2015. Participants were included if they were pregnant women in the 20th–40th week of pregnancy and they agreed to participate in this study. Individuals were excluded if they had a chronic disease or any symptom of pregnancy-related disease. The required sample size for bivariate logistic regression using the .05 significance level (α), .80 statistical power ($1-\beta$), and an effect size (d) of .15 was calculated using G*Power 3.1. The required sample size was 92, but 200 women were invited to participate to account for non-response rate [25]. Two hundred questionnaires and informed consent forms were mailed to the 33 welfare facilities in Korea, and 144 completed questionnaires from 20 facilities were returned to the researcher in sealed envelopes (response rate = 72.0%). Seven questionnaires with missing data were excluded from the analyses.

2.3. Instruments

2.3.1. Social Support Inventory (SSI)

Social support was measured using the Social Support Inventory (SSI) developed by Moon [24]. SSI evaluates perception of social support. This inventory consists of 16 items evaluating four dimensions for support: emotional, informational, material, and evaluation. Each dimension consists of four items rated on a 5-point Likert scale. Higher values indicate higher perceived social support. Content validity was established for use of this instrument with unmarried Korean mothers [24]. Internal consistency/reliability was good in this study (Cronbach's $\alpha = .95$). Each social support dimension showed internal consistency/reliability (Cronbach's α) greater than .95.

2.3.2. Rogenberg Self-Esteem Scale (RSES)

Self-esteem was measured using Rosenberg's Self-Esteem Scale (RSES) [26], a commonly used 10-item scale where each item is rated on a 4-point scale. Total scores range from 10 to 40, with higher scores indicating higher self-esteem. This scale is a validated measure of self-esteem in Korea [27] and the internal consistency/reliability for the RSES was high in this study (Cronbach's $\alpha = .80$).

2.3.3. Edinburgh Postnatal Depression Scale (EPDS)

Antenatal depression was determined with a widely used instrument, the Edinburgh Postnatal Depression Scale (EPDS) [28]. The scale was validated by Kim et al. in Korea [29]. The EPDS consists of 10 items relevant to depressed mood experienced in the past week. Each item is scored on a 0–3 scale, with higher scores indicating higher levels of depression. In Korea, there have been several validation studies of the EPDS in perinatal pregnant samples. Kim *et al.*, [29] and Choi *et al.*, [3] found that sensitivity was 77% and specificity was 87% using a cut-off score of 9/10. The present study used this cut-off score as the basis for classifying an individual as depressed or non-depressed. Scores of 9 or less indicate no depression,

while scores of 10 and greater indicate depression. Cronbach's α in the present study was .82.

2.4. Ethical Approval

The study protocol was approved by the Institutional Review Board at the K National University in Korea (IRB 2015-0010).

2.5. Statistical Analysis

Data were analyzed with SPSS software (version 20; IBM Corporation: Armonk, NY, USA). Descriptive statistics (frequencies, means, and standard deviations) were used for the general and obstetric characteristics and major variables in this study. Participants were divided into two groups based on their EPDS scores (depressed: greater than 10; non-depressed: 9 or less). Bivariate group comparisons were performed using χ^2 tests and t-tests for general and obstetric characteristics and major variables. Bivariate logistic regression was then performed, including variables that had a significant bivariate relationship with the EPDS scores and obstetric characteristics (history of childbirth).

3. Result

3.1. Participant Characteristics

Almost all subjects (62.0%) were in their 20s. Most participants (89.1%) had completed high school or beyond, and 49.6% reported that they had decided to raise their baby after delivery (versus giving the baby up for adoption). More than two thirds of the sample (77.4%) were 29–40 weeks pregnant, and 75.7% were expecting their first baby. Almost a quarter (23.4%) of the women reported that their partner did not know about the baby (Table 1).

Table 1. Comparison of Non-depressed and Depressed Groups on General and Obstetric Characteristics

(N = 137)

Characteristics		Total		Non-depressed		Depressed		χ^2	p
				(n = 35, 25.5 %)		(n=102, 74.5 %)			
		n	(%)	n	(%)	n	(%)		
Age(year)	≤19	37	27.0	12	34.3	25	24.5	2.130	.345
	20–29	85	62.0	21	69.0	64	62.7		
	≥30	15	10.9	2	5.7	13	12.8		
Education	≤Middle school	15	10.9	5	14.3	10	9.8	.537	.464
	≥High school	122	89.1	30	85.7	92	90.2		
Parenting plan	Nurture	68	49.6	19	54.3	49	48.0	.410	.815

	Non-nurture	47	34.3	11	31.4	36	35.3		
	Not decided yet	22	16.1	5	14.3	17	16.7		
Gestational age(weeks)	20–28	31	22.6	9	25.7	22	21.6	.256	.613
	29–40	106	77.4	26	74.3	80	78.4		
History of Childbirth	Nulli paraity	30	24.3	13	37.1	17	16.7	6.388	.011
	Multi paraity	107	75.7	7	62.9	7	83.3		
Unmarried Partner's knowledge of the baby	Yes	105	76.6	26	24.8	79	77.5	.146	.703
	No	32	23.4	9	28.1	23	22.5		

3.2. SSI and RSES

The mean SSI score was 49.71 (SD = 12.29), and scores on each SSI dimension were 12.26 or greater. The mean RSES score was 25.99 (SD = 4.76) (Table 2).

Table 2. Comparison of Non-depressed and Depressed Groups on the SSI and RSES

Variables	(N = 137)				
	Total	Non-depressed (n = 35)	Depressed (n = 102)	t	p
	M ± SD	M ± SD	M ± SD		
SSI	49.71±12.29	54.76±11.81	47.98±12.03	2.892	.004
Emotional support	12.61±3.12	13.99±2.98	12.13±3.03	3.143	.002
Informational support	12.26±3.08	13.773±2.90	11.75±2.99	3.403	<.001
Material support	12.32±3.23	13.64±3.15	11.87±3.15	2.876	.005
Evaluation support	12.52±3.25	13.40±3.19	12.22±3.23	1.861	.065
RSES	25.99±4.76	28.43±2.98	25.16±4.75	3.668	<.001

3.3. Comparison between Non-depressed and Depressed Groups on General and Obstetric Characteristics

The overall prevalence of antenatal depression, as defined by EPDS scores of 10 or greater, was 74.5%. A history of childbirth was associated with antenatal depression ($p < .005$); unmarried women with a history of childbirth were less likely to report antenatal depressive symptoms than were women without a history of childbirth (62.9% vs. 83.3%, $\chi^2 = 6.388, p = .011$) (Table 1).

3.4. Comparison between Non-Depressed and Depressed Groups on SSI and RSES

There were significant differences between non-depressed and depressed groups in the scores for the SSI ($t = 2.892, p = .004$) and RSES ($t = 3.666, p < .001$).

Additionally, there were significant differences between the two groups on emotional ($t = 3.143, p = .002$), informational ($t = 3.403, p < .001$), and material ($t = 2.876, p = .005$) SSI dimension scores (Table 2).

3.5. Predictors of Antenatal depression According to Bivariate Logistic Regression in Unmarried Pregnant Women

Results of the bivariate logistic regression are presented in Table 3. A higher risk for antenatal depression was associated with a history of nulliparity ($\text{Exp}(B) = .298, p = .030$), less informational support ($\text{Exp}(B) = .484, p = .006$), more evaluation support ($\text{Exp}(B) = 2.457, p = .001$), and lower RSES ($\text{Exp}(B) = .862, p = .027$). No other variables were statistically significant in the regression model (Table 3).

Table 3. Predictors of Antenatal Depression in Unmarried Pregnant Women according to Bivariate Logistic Regression

		(N = 137)				
Variables		B	SE	WALS	Exp(B)	p
Age (yrs.) (Reference: ≥ 30)	≤ 19	-1,004	.969	1.072	.366	.300
	20–29	-.731	.919	.633	.481	.426
Education (Reference: \geq High school)	\leq Middle school	-.465	.825	.317	.628	.573
	Nurture	.264	.769	.118	1.302	.731
Parenting plan (Reference: Not decided yet)	Non-nurture	.772	.792	.951	2.165	.330
	20–28	-.438	.606	.522	.645	.470
Gestational age (weeks) (Reference: 29–40)	Multipara	-1.211	.560	4.683	.298	.030
History of Childbirth (Reference: Nullipara)	Yes	-.231	.624	.137	.793	.711
Unmarried partner's knowledge of the baby (Reference: No)						
Emotional support		-.073	.250	.086	.929	.770
Informational support		-.726	.266	7.427	.484	.006
Material support		-.296	.266	1.228	.745	.268
Evaluation support		.899	.274	10.787	2.457	.001
RSES		-.148	.067	4.859	.862	.027
Constant		8.463	2.096	16.303	.000	4738.142
-2 Log likelihood				115.051		
χ^2				40.555 ($p < .001$)		
Cox & Snelle R^2 /Nagelkerke R^2				.257/.378		
Predicted group membership(%)				80.3		

4. Discussion

The average antenatal depression score for unmarried pregnant women was 13.37. This is higher than the average antenatal depression score for married pregnant women of 7.62 [10] and 7.80 [18]. The rate of antenatal depression according to an EPDS cut-off of 9/10

was 74.5% [29]. Previous research using the EPDS with identical clinical efficacy reported that the incidence of antenatal depression in married women was 26.3–35.5% [3,19]. From this result, it is evident that antenatal depression in unmarried women is a serious issue. This is consistent with previous research showing that unmarried pregnant women who lack support are 1.63 times more likely to suffer from antenatal depression compared to women who are married or living with a partner [7]. Antenatal depression may cause stillbirth, premature birth, and low birth weight, and is a risk factor for postnatal depression [7, 10]. However, it is not mandatory to receive screening for antenatal depression before childbirth in Korea. Moreover, healthcare providers show a lack of interest in antenatal depression. In other words, antenatal depression management is lacking for unmarried pregnant women in comparison to married pregnant women who have regular pre-birth checkups [30]. Therefore, support policies for unmarried pregnant women are needed and should be based on early assessments.

Predictors of antenatal depression among unmarried pregnant women are birth experience, informational support, evaluation support, and self-esteem. Participants with no birth experience have a higher risk of antenatal depression than do participants with birth experience. This is inconsistent with previous studies. Choi et al. [3] studied factors related to antenatal depression in 205 pregnant women and found no significant relationship between birth experience and antenatal depression. Lee and Park [18] also found that birth experience had no influence on the prevalence of antenatal depression. However, these results may be different from the present study because in those studies 99% of participants were married. Unmarried pregnant women experience stress in various areas due to unexpected pregnancy. They experience stress about their children's futures, their future, family relationships, and deliveries. Of these stress factors, concern about delivery is the greatest source of stress [24]. This was most prominent among primiparas [31]. Thus, in this study, participants with birth experience had relatively low stress compared to primiparas, and this affected self-esteem [19] and antenatal depression [18]. Approximately 24% of participants in this study had experienced childbirth more than once, and these participants experienced less stress and had relatively high self-esteem compared to primiparas. Childbirth experience appears to be predictor of antenatal depression. However, these results need to be verified in future studies that measure antenatal depression in unmarried pregnant women, as well as their stress level.

In this study, higher informational support (a form of social support) was associated with a lower likelihood of antenatal depression in unmarried pregnant women. Informational support is defined as providing information so that an individual can cope with a problem [32]. Ahn and Kim [25] suggested that higher perception of informational support by unmarried pregnant women is associated with higher self-esteem. In addition, social support can act as a buffer to absorb stress that comes from premarital pregnancy, reduce depression, and increase self-esteem [21]. Unmarried pregnant women use informational support to deal with pregnancy and birth. Therefore, these findings suggest that having informational support can reduce depression and increase self-esteem.

However, this study shows that high evaluation support increases the probability of antenatal depression. Evaluation support is about transferring information related to self-evaluation, *i.e.*, acknowledging or neglecting one's acts [32]. Individuals find their value when their self-evaluation is similar or identical to others' evaluations of them. Yet, if individuals have negative self-evaluations or others' evaluations of them do not match their own, they may become depressed [24]. Therefore, evaluation support should be carefully provided for unmarried pregnant women. Furthermore, future research on the negative effects of evaluation support in unmarried pregnant women is needed.

Low self-esteem was found to be a predictor of antenatal depression. This is consistent with previous studies [3,18,19,33] showing that lower self-esteem is related to higher rates of antenatal depression in pregnant women. In particular, self-esteem in unmarried pregnant women is related to various types of stress caused by unexpected pregnancy

[24]. In addition, in this study, low self-esteem was associated with mismatched evaluations (self/others); therefore, self-esteem enhancement strategies should be considered.

This study identified predictors of antenatal depression in unmarried pregnant women, which has rarely been studied in Korea. Our results indicated that unmarried pregnant women have a high incidence of antenatal depression. In addition, we found that higher self-esteem and higher perception of informational support reduce the risk of developing antenatal depression, but that evaluation support increases the risk of developing antenatal depression. However, the results from this study may not generalize to all unmarried pregnant women because the participants were limited to unmarried pregnant women in welfare facilities.

5. Conclusions

In this study, we identified that birth experience, informational support, evaluation support, and self-esteem are predictors of antenatal depression. In other words, unmarried pregnant women with no previous delivery experience, low informational support, high evaluation support, and low self-esteem have a high risk of developing antenatal depression. Therefore, antenatal depression management should be added to government support policies for unmarried pregnant women. In addition, nursing interventions that consider predictors of antenatal depression are needed.

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