

# Prevalence and determinants of antenatal depression among women attending primary health care centers in Western Saudi Arabia

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## ABSTRACT

**الأهداف:** قياس مدى انتشار الاكتئاب خلال الحمل بين الحوامل اللواتي يحضرن عيادات متابعة الحمل في مراكز الرعاية الصحية الأولية بجدة وتحديد العوامل المرتبطة به.

**الطريقة:** تعتبر هذه الدراسة دراسة مستعرضة، حيث تمت مقابلة 320 امرأة حامل في عيادات متابعة الحمل في مراكز الرعاية الصحية الأولية التابعة لوزارة الصحة بجدة، خلال الفترة من يناير 2017 إلى فبراير 2017م. وتم استخدام استبيان مملأ ذاتياً ويتكون من جزئين: جزء يحتوي على المتغيرات الاجتماعية والديموغرافية والآخر أداة لقياس اكتئاب خلال الحمل.

**النتائج:** عانت أكثر من نصف المشتركات (57.5%) من الاكتئاب. وكانت أعلى المعدلات لفكرة المرأة الحامل حول إيذاء نفسها ( $2.7 \pm 0.60$ ). ووجد أن هناك عدة عوامل ارتبطت مع الاكتئاب بين المشاركات، منها الحمل مع التقدم في العمر، تدني المستوى التعليمي، تعدد الحمل، ولادة الإناث، نقص الدعم الأسري والتعرض للعنف، التاريخ العائلي أو الشخصي للإصابة بالاكتئاب، والمشاكل المالية.

**الخاتمة:** معدل انتشار الاكتئاب قبل الولادة بين النساء الحوامل في جدة بنسبة 57.5%. وشملت العوامل الهامة المرتبطة بالاكتئاب خلال الحمل: ولادة عدد من البنات، والتشخيص السابق بالاكتئاب والمشاكل المالية.

**Objectives:** To measure the prevalence of antenatal depression among pregnant women attending the primary health care (PHC) antenatal care clinics in Jeddah, Saudi Arabia and to determine associated factors.

**Methods:** Following a cross-sectional study design, 320 pregnant women attending the antenatal care clinics in the Ministry of Health PHC Centers in Jeddah, Saudi Arabia between January 1st 2017 and February 15th 2017 were interviewed. A self-administered questionnaire used for data collection asked about socio-demographic variables and included the Edinburgh Postnatal Depression Scale.

**Results:** The most common contributor was the harming herself (mean±SD,  $2.7 \pm 0.60$ ). Factors significantly associated with depression among participants were the number of daughters, previous diagnosis of depression, and financial problems.

**Conclusions:** The prevalence of antepartum depression among pregnant women in Jeddah is 57.5%, and the greatest contributor is the thought of harming herself.

*Saudi Med J 2017; Vol. 38 (12): 1237-1242  
doi: 10.15537/smj.2017.12.21262*

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*Received 14th September 2017. Accepted 8th November 2017.*

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Antenatal depression is a depressive episode that begins during pregnancy, and if untreated, it is a significant predictor of postpartum depression. Research conducted in the U.S. showed that one-third of postnatal depression cases begin during pregnancy. Evidence indicates that symptoms of depression during pregnancy are more prevalent than during the postnatal period.<sup>1</sup> Depressed mothers cannot function properly, and they are prone to adverse effects including noncompliance with prenatal care clinic attendance, being less concerned with her health in general, decreasing the quantity of their nutrition, getting irregular or reduced sleep, and pre-eclampsia. They

might also have increased uterine irritability, preterm delivery, and postpartum bleeding, and symptoms could be so severe that they commit suicide.<sup>2,3</sup> Negative consequences associated with babies of mothers with antenatal depression include increased risk of low birth weight or small-for-gestational age, smaller head circumference, stillbirth, and birth asphyxia. Maternal depressive symptoms and stress during the second and third trimesters were shown to be inversely related to poorer mother-infant bonding during the postnatal period. Antenatal depression also has negative outcomes on the mother's social and personal adjustments and marital relationships.<sup>2-5</sup> Almost 10% of pregnant women worldwide experience depression, and the rate is higher (15%) in developing countries. It has been estimated that depressive disorders will be the leading cause of global disease burden in women by the year 2020.<sup>6,7</sup> The prevalence of antenatal depression was 33.8% in Tanzania.<sup>5</sup> Al-Azri et al<sup>8</sup> showed that the prevalence of antenatal depression among Omani women was 24.3%. In Egypt, Abdelhai et al<sup>9</sup> showed that 63% of women expressed simultaneous anxiety and depression. The literature on depression during pregnancy in Saudi Arabia is scarce. A study performed in Riyadh City reported that the prevalence was around 18.6%.<sup>3</sup> Diagnosing antenatal depression is difficult because the physiological signs of normal pregnancy overlap the symptoms of antenatal depression.<sup>2</sup> A recent systematic review in Tanzania recommended administering a screening tool to identify women with antenatal depression, and it should be a universal practice to promote the long-term well-being of mothers and babies.<sup>5</sup>

Antenatal depression has not been sufficiently studied because most studies of maternal depression focus on postpartum depression.<sup>2,10</sup> Moreover, antenatal depression has increased worldwide, and early detection and proper management are cornerstones to preventing serious complications such as postpartum depression and psychosis. Therefore, this study aimed to measure the prevalence of antenatal depression and to determine the associated risk factors associated among pregnant women attending prenatal care clinics at Ministry of Health primary care centers in Jeddah, Saudi Arabia.

**Methods.** Following a cross-sectional design, this study included 320 women who attended the antenatal

clinics at 8 primary health care (PHC) centers from the northern part, and 6 PHC centers from the southern part of Jeddah City, Saudi Arabia, between January 1st 2017 and February 15th 2017. Using the Raosoft website,<sup>11</sup> the sample size (n=320) was calculated to detect an expected 20% prevalence of antenatal depression with a 4% margin of error and 80% statistical power using a total population of 2,000 and a confidence level of 95%.

The inclusion criteria were pregnant women living in Jeddah, with a gestational age greater than 8 weeks attending an antenatal clinic in the selected PHC centers and any pregnant women not fulfilling these inclusion criteria were excluded.

Written official approval was obtained from the Joint Program of Family and Community Medicine before conducting the research. Approval by a higher authority (Ministry of Health) was also received. The study was conducted according to the principles of the revised Declaration of Helsinki. Written anonymous consents were received from all participants on the first page of the questionnaire, where a direct question asked for the participant to check a box signifying consent before answering any other sections of the questionnaire. No names, file numbers, or any identifying information was obtained, and all collected data were kept confidential, giving access only to the researcher and statistician. All women who were approached were given a full explanation of the study and were informed of their rights to refuse to participate. However, those women diagnosed with antenatal depression were referred immediately to their primary doctor.

The data collection tool comprised a self-administered questionnaire that consisted of the sociodemographic characteristic questionnaire and the translated Arabic version of the Edinburgh Postnatal Depression Scale (EPDS) questionnaire, validated by the Department of Health, Government of Western Australia, copyrighted in 2006. It is a widely-used first step for identifying antenatal depression and was successfully used in the current study. It had been proven valid and reliable for identifying women at risk for depression during and after pregnancy. Its reliability and validity in psychiatric and epidemiologic studies have been extensively demonstrated.<sup>5,12</sup> Scores of at least 13 were considered to indicate probable antenatal depression and the need for further evaluation.

The IBM SPSS Statistics for Windows (IBM Corp, Armonk, NY, USA) version 21 package was used for statistical analysis. All categorical data were defined in terms of number (%), and numerical data were defined in terms of means and standard deviations (SDs). Binary logistic regression was performed to assess the

**Disclosure.** Authors have no conflict of interests, and the work was not supported or funded by any drug company.

association between antenatal depression and factors potentiating depression in pregnant women. Statistical significance was recognized when *p*-value was less than 0.05.

**Results.** Half the interviewed pregnant women (51.2%) were aged between 28 and 37 years; only 6 (1.9%) were aged less than 17 years. Most (83.4%) of the women, as well as their husbands (80.9%), had high education levels. Nevertheless, more than half the women (57.5%) were jobless, and the most common job was teacher (17.5%). Most (97.1%) were currently married. One-third of the women (33.1%) reported monthly incomes of more than 10,000 SR, and 41.6% reported monthly incomes ranging between 5,000 and 10,000 SR (Table 1).

Table 2 shows that most participants were either in their second (58.8%), or third (30.6%) trimester, and that most (82.2%) indicated they started their antenatal care visits in the first trimester. Most were multiparous, and almost half (46.3%) had been pregnant fewer than

5 times. One-third (33.4%) reported more than 5 deliveries. More than one-third (37.2%) stated they had previous abortions. Almost one-quarter (23.5%) of the multiparous women had previous cesarean sections, and 17.3% previously had both vaginal and cesarean section births. It had been more than 2 years since the previous pregnancy for 48.6% of the multiparous participants. A total of 47.8% of the women experienced complications in previous pregnancies, and most were medical (21.2%) and psychological (6.7%) problems. Additionally, 15.7% had more than one complication. In the current pregnancy, 17.8% stated they experienced a medical problem, 12.8% stated they experienced a psychological problem, and 12.2% stated they experienced more than one complication (Table 2). We found that 48.1% of the participants planned for the current pregnancy, but 36.3% did not. Furthermore, 10% expressed that "it is not welcomed from their own side," and 5.6% said,

**Table 1** - Characteristics of the interviewed pregnant women (N=320).

Characteristics	n	(%)
<b>Age</b>	6	(1.9)
<17 years	116	(36.3)
18-27 years	164	(51.2)
28-37 years	34	(10.6)
>37 years		
<b>Education level</b>	15	(4.7)
Read and write	38	(11.9)
Primary/intermediate	267	(83.4)
Higher education		
<b>Education level of the husband</b>	13	(4.0)
Read and write	48	(15.0)
Primary/intermediate	259	(80.9)
Higher education		
<b>Occupation</b>	184	(57.5)
Jobless (housewife)	56	(17.5)
Teacher	33	(10.3)
Physician/engineer/lawyer	23	(7.2)
Administrative job	5	(1.6)
Business	2	(0.6)
Technical job	17	(5.3)
Others		
<b>Current marital status</b>	311	(97.1)
Married	4	(1.3)
Widowed	4	(1.3)
Divorced	1	(0.3)
Separated		
<b>Monthly income</b>		
<2500 SR	18	(5.6)
2500-<5000 SR	63	(19.7)
5000-<10000 SR	133	(41.6)
>10000 SR	106	(33.1)

**Table 2** - Obstetric history of 320 women who attended the antenatal clinics.

Characteristics	n	(%)
<b>Gestational age</b>		
First trimester	34	(10.6)
Second trimester	188	(58.8)
Third trimester	98	(30.6)
<b>First Antenatal Care visit</b>		
First trimester	263	(82.2)
Second trimester	45	(14.1)
Third trimester	12	(3.8)
<b>Number of previous pregnancies</b>		
Nulliparous	65	(20.3)
<5 deliveries	148	(46.3)
≥5 deliveries	107	(33.4)
<b>Previous abortions</b>		
Yes	119	(37.2)
No	201	(62.8)
<b>Mode of previous deliveries (n=255)</b>		
Vaginal	151	(59.2)
Cesarean	60	(23.5)
Both vaginal and cesarean	44	(17.3)
<b>Duration between previous and current pregnancies in multiparous (n=255)</b>		
<1 year	46	(18.0)
1-2 years	85	(33.3)
>2 years	124	(48.6)
<b>Complications of previous pregnancies in multiparous (n=255)</b>		
Medical problems	54	(21.2)
Psychological problems	17	(6.7)
Complications during labor	11	(4.3)
More than one complication	40	(15.7)
No previous complication	133	(52.2)
<b>Complications in the current pregnancy</b>		
Medical problems	57	(17.8)
No complication	183	(57.2)

**Table 3** - Mean scores for the response of the pregnant women on the EPDS items assessing depression (Score 0-3 for each item).

Items of EPDS	Mean $\pm$ SD
The thought of harming myself has occurred to me	2.7 $\pm$ 0.60
I have been anxious or worried for no good reason	1.7 $\pm$ 0.88
Have been so unhappy that to cry	1.7 $\pm$ 0.94
Have felt sad or miserable	1.6 $\pm$ 1.01
I have felt scared for no very good reason	1.5 $\pm$ 0.92
I have been so unhappy that I have had sleeping difficulty.	1.5 $\pm$ 0.98
Felt happiness (Reversed)	1.1 $\pm$ 1.01
Looked forwards with enjoyment to things (Reversed)	1.1 $\pm$ 0.96
Things have been getting on top of me	1.1 $\pm$ 0.94
I have blamed myself unnecessarily when things went wrong	1.0 $\pm$ 0.87
*total score range from 0 to 30	

“it is not welcomed by the husband.” Results show that half (43.9%) of the multiparous pregnant women had 3 or more previous live births, and most (92.9%) had less than 3 male children. Fewer (78%) had less than 3 female children. Slightly less than half (46.7%) of the multiparous women indicated they had previous low birth weight babies. More women indicated that their current fetus was female versus male (39.4% versus 29.4%). However, 46.8% wished that the current baby would be male, whereas 26.6% wished it were female.

Results show that almost half (45%) of the participants complained of a lack of support at home, and almost one-third (32.2%) were employed while 28.1% had financial difficulties. Additionally, 17 (5.3%) of the women claimed they had been exposed to violence. The majority (87.5%) reported that one or more family members were suffering from psychological problems, and of those, 10.9% were their mothers, and 33.4% were in more than one family member. One in five (21.6%) expressed they were diagnosed with depression, 12.1% looked for medical consultation, and 14 (4.4%) received treatment. About two-thirds (62.2%) stated they had sleep disorders.

Of those who had previous abortions (n=119), most (110, 92.4%) reported they suffered from one or more

psychological problems following abortion, mostly grief (46.2%), depressed mood and disappointment (16.8%), and anxiety (12.6%). Additionally, 16.8% suffered from a combination of these. Based on the overall sum of scores for the items on the EPDS, results illustrate that more than half of the participants had depression (57.5%).

Table 3 shows the contribution of each item of the EPDS on the overall score. The ones that contributed the most were the thought of harming herself (mean  $\pm$  SD, 2.7  $\pm$  0.60), being anxious without reason (1.7  $\pm$  0.88), unhappiness to the extent of crying (1.7  $\pm$  0.94), and feeling sad, or miserable (1.6  $\pm$  0.60; Table 3).

Table 4 shows the logistic regression model for predictors of antenatal depression based on our participant group. The number of daughters, previous diagnosis of depression, and financial problems were significant predictors. Controlling for other factors, having more than 3 daughters increases the likelihood for depression by almost four-fold (odds ratio, 4.361, 95% confidence interval [CI]: 1.822-10.436), previous diagnosis with depression increases it by almost three-fold (odds ratio, 3.105, 95% CI: 1.430-6.741), and financial problems increase it by around 3-fold (odds ratio, 3.123, 95% CI: 1.575-6.195;  $p < 0.05$ ; Table 4).

**Discussion.** This current study shows that more than half (57.5%) the participants had antenatal depression, a prevalence which is slightly higher than that reported by Moawed et al,<sup>3</sup> who found the prevalence was 44.2% among pregnant women in Riyadh, Saudi Arabia. These dissimilarities could be attributed to the assessment tools used. We used the EPDS, which has proven validity and reliability,<sup>11</sup> rather than the Beck Depression Inventory. In addition, our study setting was PHC centers rather than a hospital.

Our detected prevalence was lower than that found in Egypt, where 63% of pregnant women expressed simultaneous anxiety and depressive manifestations.<sup>9</sup> This difference might be due to the inclusion of anxiety

**Table 4** - Logistic regression for predictors of antenatal depression.

Predictors	B	S.E.	Wald	P-value	Exp (B)	95% CI.for EXP (B)	
						Lower	Upper
No. of daughters (index <3 daughters)	1.473	.445	10.94	.001	4.361	1.822	10.44
Previously diagnosed with depression	1.133	.396	8.20	.004	3.105	1.430	6.74
Financial problems	1.139	.349	10.62	.001	3.123	1.575	6.20
Constant	-.235	.182	1.68	.195	.790		

*P*-value<0.05 considered as statistically significant

with depression. On the other hand, much lower figures were found in Finland (0.8%),<sup>14</sup> Spain (14.8%),<sup>15</sup> Turkey (16.8%),<sup>16</sup> Cote d'Ivoire (32.9%),<sup>17</sup> and Tanzania (33.8%).<sup>5</sup>

Fisher et al<sup>18</sup> found that depression in pregnancy is at least as prevalent in high- as in low-income countries, if not more so. Wide variations in reported prevalence rates could stem from differences in study setting, sampled population, or measurement and assessment tools.

Several researchers found factors that are either associated with or potentiate antenatal depression. The greatest risk factor for major depression during pregnancy is a history of depression before pregnancy, which was associated with a 22.4-fold increase in the prevalence of major depression during pregnancy.<sup>13</sup> This strong association was evident in our study: a significantly higher prevalence of antenatal depression was found among those who reported depression diagnoses, who needed medical consultations, and who were treated for depression (odds ratio, 3.123, 95% CI; 1.575-6.195).

Shidhaye et al<sup>19</sup> assessed the association between gender preference for a male child with antenatal depression in rural Maharashtra and demonstrated that the desire to deliver a male child was strongly associated with the outcome of antenatal depression. Moreover, Escriba-Aguir et al<sup>20</sup> attributed this response to disappointed spouses in addition to negative reactions of family members toward the birth of a female, thus initiating or exacerbating depression. This notion supports our findings that antenatal depression is significantly more likely to occur in mothers who have three or more daughters.

El-Behadli et al<sup>21</sup> noted that family financial resources might not be directly related to antenatal depression, but it could mediate the influence of social support and fears of not meeting the demands of the coming child. This is consistent with our findings, where a significantly higher proportion of those with antenatal depression reported family financial problems.

The limitations of this study are the sample size of 320, which was calculated for a one-month duration, but it takes 2 weeks more to reach this target sample size because of the limited number of ANC clinics in PHC centers and the lack of participation. Also, there are fewer pregnant women attending PHC centers for ANC compared to specialized obstetrics and gynecology clinics in hospitals. Intensive research and clinical attainment must be directed toward early detection and understanding antenatal depression to develop powerful interventions that are suitable for integration into the PHC system in Saudi Arabia.

In conclusion, the prevalence of antepartum depression is high among pregnant women in Jeddah. The greatest contributors are for the thought of self-harming being anxious without reason, being unhappy to the extent of crying, and feeling sad or miserable. Several risk factors are associated with antepartum depression and include delivery of female babies, having past or a family history of depression, and exposure to financial problems.

We therefore recommended that pregnant women be routinely screened for depression during antenatal care. The necessary psychological care for pregnant women, especially those with risk factors for antenatal depression, should be provided by PCH centers. Moreover, pregnant women and their family members should receive health education about measures they can take to avoid antenatal depression.

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## References

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