

# Prevalence and Factors Associated with Antenatal Depression in Makkah Al-Mokarramah, 2019

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**Abstract Background:** Depression is one of the major disease affecting women and is considered as one of the most common causes of mental illness during pregnancy. Antenatal depression is a risk factor for postpartum depression, adverse effect on obstetric and neonatal health conditions. **Objectives:** To estimate the prevalence and determine the risk factors of depression among pregnant women attending the antenatal clinic in Makkah between 1<sup>st</sup> and 26<sup>th</sup> of December 2019. **Subjects and methods:** Analytic cross-sectional study was conducted in Makkah Al-Mokarramah including a representative random sample of pregnant women who attending selected during the time of 1<sup>st</sup> - 26<sup>th</sup> of December 2019. Data were collected by using a questionnaire including sociodemographic data and risk factors associated with antenatal depression as well as the Edinburgh Postnatal Depression Scale (EPDS) to screen for depression. **Results:** The study included 136 women. Their age ranged between 20 and 52 with a mean±SD of 31.0±6.2 years. More than one third (41.2%) of the women were at high risk for depression whereas 24.3% were at possible risk for depression. Participants' house income was the only socio-demographic factor significantly associated with risk of antenatal depression, p=0.012. None of obstetric factors was significantly associated with the risk of antenatal depression. In the current pregnancy, having no family support, particularly from the husband was a significant factor for antenatal depression, p=0.007. Also, having family history of antenatal depression was significantly associated with antenatal depression, p=0.018. **Conclusion:** Antenatal depression is a relatively common health problems encountered by pregnant women attending antenatal care at primary healthcare centers, Ministry of Health in Makkah city.

**Keywords:** Antenatal, depression, primary healthcare, prevalence, associated factors

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## 1. Introduction

Depression is one of the major disease affecting women and is considered as one of the most common causes of mental illness during pregnancy, with around 12% at some point [1]. Antenatal depression is a risk factor for postpartum depression, adverse effect on obstetric and neonatal health conditions [1].

Depression is mental illness affecting adult and pregnant women in the same way of low mood, loss of interest, low energy and sleep disturbance, and it will lead her to not taking care of herself, her nutrition, her following up in a clinic or for her fetus. In severe cases, mothers' suffering might be severe, that led to suicide [2].

Virtually all women can suffer from mental disorders during pregnancy and in the first year after delivery [2].

Globally maternal mental health problems are considered as a public health challenge about 10% of pregnant women and 13% of women who have just given the birth struggle a mental disorder, primarily depression.

In developing countries, this is even higher, i.e. 15.6% during pregnancy and 19.8% after child birth [2].

Until now we faced the same problem, according to studies done in Saudi Arabia: the newest one at 2018, in Eastern province of Saudi Arabia that found the prevalence of depression was 26.8% among pregnant women [3], the second one at 2017, in Western province of Saudi Arabia that found: The prevalence of antepartum depression among pregnant women in Jeddah is 57.5%, and the greatest contributor is the thought of harming herself [4]. The third one at 2007, in Riyadh city that shows: prevalence rates of antenatal depression were mild to severe and extreme depression, were 18.6%, 11.7% and 6.6% respectively [5] and they recommended to Early detection of depression during pregnancy is awful because depression can unfavorably affect birth outcomes and neonatal health and if left untreated can persist after birth can impair mother-infant attachments and have a cognitive, emotional, and behavioral impact for children [5].

Worldwide the newest one in Pakistan in 2017, the Data indicates a high level of depression in pregnant women, 81%. Depression is more prevalent in women with young

age, those who have less number of parity & gravida and the ones that live in a joint family system [6].

Antenatal depression associated with preterm labour exceeding 20%, early breastfeeding cessation [7,8,9], strongly associated with postpartum depression [10] and spontaneous abortions [11].

For that, the US Preventive Services Task Force Recommendation Statement (USPSTF) recommended screening for depression in pregnant and postpartum women to ensure accurate diagnosis, effective treatment, and appropriate follow-up. (B recommendation) [12].

Because the majority of previous studies focused on postpartum depression and no sufficient studies assessed the antenatal depression in the Kingdom of Saudi Arabia (KSA), there is an increased need to evaluate it and study it. Therefore this study was carried out to estimate the prevalence and determine the risk factors of depression among pregnant women attending the antenatal clinic in Makkah, KSA.

## 2. Review of Literature

It was reported that the rate of depression prevalence during different periods of pregnancy was 7.4%-15% [13,14]. The incidence of depression is increased to 42.5 % in women who had a previous history of depression [15]. In a systematic review of 17 articles, the reported prevalence of antenatal depression prevalence was 15.6% in 7 low to middle-income countries [16]. In Saudi study [3], it was found that depression was prevalent among 26.8% of pregnant women who attended clinics in a university hospital in Eastern province. A study from Saudi Arabia reported a higher prevalence of perinatal depression among pregnant women, 44.2% [17]. Another Saudi study [18], reported a higher prevalence of antenatal depression that reached to 54.5%, with the highest rate in the first trimester 20.2%, then decreased to 15% in the second trimester and rose again in the third trimester 18%. Higher prevalence was reported in Jeddah as the prevalence was estimated to be 57.5% [4]. The prevalence of antenatal depression in Tanzania and Oman was 33.8% and 24.3% respectively [19,20], whereas in Egypt, there were 63% of females showed simultaneous anxiety and depression [21]. In one study, it was reported that the prevalence of antenatal depression in Jordanian women was 19% [22]. The prevalence of depression decreased in more developed countries, it was 5.6% in Japan, 7.7% in Sweden, 9% in United States [23]. In the Saudi study, it was reported that the level of depression was affected by age, level of education of women and husbands, monthly income [17]. Another Saudi study reported some of the previous risk factors of antenatal depression in pregnant women including the level of education, and other additional risk factors including employment history, unplanned pregnancy and lack of partner support [18]. Other risk factors were reported by Moawed et al. and they included pregnancy and marital status, number of previous abortions, stillbirths and children with low birth weight as well as health complications, all the previous factors increased the antenatal depression risk [17]. A study by Lancaster et al. showed that younger age and low education level were

two risk factors of antenatal depression [24]; another study by Rahman et al. [25] reported that unplanned pregnancy has two-fold risk for women to develop antenatal depression.

## 3. Methods

### 3.1. Study Design

Analytic cross-sectional study was adopted in the present study.

### 3.2. Study Area

The study was conducted in Makkah Al-Mokarramah, the holy city, which is the centre of the earth, the place of Al-Qur'an arrival. Makkah contains around 85 primary health care centers which give a health service for all Saudi people for free. The study was in the all 3 sectors inside Makkah, the Zahir sector [Nawareyah primary health care "PHC"], the Kakia sector [Kudai and Hegrah PHC] and the Adl sector [Awaly PHC].

### 3.3. Study Population

Pregnant women are attending the selected PHCs in Makkah Al-Mokarramah, during the time of 1<sup>st</sup> - 26<sup>th</sup> of December 2019.

### 3.4. Eligibility Criteria

#### 3.4.1. Inclusion Criteria

- Pregnant women are attending primary health care.

#### 3.4.2. Exclusion Criteria

- Illiterate women.

### 3.5. Sample Size

The sample size was estimated using Raosoft statistical program. The prevalence of antepartum depression among pregnant women in Jeddah was 57.5% on 2017, so prevalence of 57.5 % was taken and the confidence interval was 95% with a margin of error of 5%, the sample size was 122. Moreover, A 10% of the total population was added for incomplete sampling. Therefore, the minimum sample size equals 134.

### 3.6. Sampling Technique

The researcher uses the simple random technique for choosing the primary health care centre by using (<http://www.random.org>), first in Makkah there are 3 sectors, and by randomization is selected the Zahir sector [Nawareyah PHC], the Kakia sector [Kudai and Hegrah PHC] and the Adl sector [Awaly PHC], and the researcher collected data from pregnant women attending the selected primary health care, by systematic random sample technique every 4<sup>th</sup> pregnant lady was selected from list of appointments for the clinics. This procedure was applied every day during the study period until the numbers of participant was completed.

### 3.7. Data Collection Tool (Instrument)

The study materials consisted of two parts. The first consisted of sociodemographic data and risk factors associated with antenatal depression. Specifically, demographic details, number of children, intended pregnancy, planned pregnancy, partner support, and social support were assessed. Face and content validity were conducted via a panel of experts in family medicine. These instruments were also piloted with a small sample of childbearing Saudi women. Results showed that the measures were reliable and valid. The second assessment consisted of the Edinburgh Postnatal Depression Scale (EPDS), a 10-item questionnaire with scores ranging from 0 to 3 that evaluates any depressed mood experienced over the past week. [1,16] Items from the EPDS include those that probe depressed mood, sleep disturbances, lack of interest in activities, suicidal thoughts, and feelings of guilt. Participants who scored  $\leq 9$  were considered having low score and those scored  $\geq 12$  were considered having high score for depression. This categorization has been proved to be predictive of the severity of depression. [26]

### 3.8. Data Collection Technique

The researcher distributed the questionnaire to the participant at the time waiting for their appointment in the waiting area. The researcher introduced herself to the participant and explained briefly what the research was about and what did the questionnaire contain. Answering the questionnaire took around 10-15 minutes.

The researcher took written consent from the participant which included; the participant has the right to choose either to participate in the research or not, she had the choice to withdraw anytime without any consequences, all her information were kept confidential and were used only in the research purposes. After finishing, the researcher collected the questionnaire on the same day.

### 3.9. Study Variables

- **Dependent variable**

Prevalence of antenatal depression

- **Independent variables**

These included associated risk factors of antenatal depression: (gestational age, planning for pregnancy, number of previous pregnancies, previous abortion, mode of previous deliveries, duration between previous and current pregnancy in multiparous, complications of previous pregnancies in multiparous and complications in current pregnancy, baby gender, family support including husband support), family history of antenatal depression, chronic illness and sociodemographic variables such as age, gender, education, occupation and income.

### 3.10. Data Entry and Analysis

- The researcher used the statistical program for social sciences with version 25 for data entry and analysis.
- Frequencies, means, and standard deviations were calculated as appropriate on the demographic variables. Chi-square tests and one-way analysis of variance tests were performed to identify risk

factors for antenatal depression. An alpha level of 0.05 was used for all tests to indicate statistical significance.

### 3.11. Ethical Considerations

- Research committee approval.
- Approval from the joint program of Family and Community medicine in Makkah al Mokarramah.
- Permission from General Directorate of Health Affairs and Directors of Al Nawareyah, Kudai and Hegrah, Awaly PHC centers.
- Written consent was obtained from the participant.
- All collected data were kept confidential.

## 4. Results

### 4.1. Socio-demographic Characteristics

The study included 136 women. Their age ranged between 20 and 52 with a mean $\pm$ SD of 31.0 $\pm$ 6.2 years. All of them were currently married. The remaining socio-demographic characteristics are summarized in Table 1. Majority were Saudis (81.6). More than half were completed university education (54.8%). Most of them (76.8%) were house wives. And have an average house income (77.4%).

**Table 1. Socio-demographic characteristics of the participants (n=136)**

Socio-demographic variables	Frequency	Percentage
<b>Nationality</b>		
Saudi	111	81.6
Non-Saudi	25	18.4
<b>Level of education (n=135)</b>		
Completed primary school	8	5.9
Completed middle school	9	6.7
Completed secondary school	44	32.6
Completed university	74	54.8
<b>Occupation (n=134)</b>		
Government employee	25	18.7
Private employee/Business women	6	4.5
House wife	103	76.8
<b>House income (n=128)</b>		
Below average	20	15.6
Average	99	77.4
Above average	9	7.0

### 4.2. Obstetric Characteristics

More than half of the women (58.1%) presented in the third trimester whereas 24.3% presented in the second trimester. Most of them (80.1%) regularly visited the primary health care center during pregnancy. The current pregnancy was planned in about half of cases (50.4%). Number of previous pregnancies exceeded three among 25.2% of women. History of previous abortion was reported by 39.7% of the participants; it was more than once in 20.6% of them. History of previous cesarean section was observed among 31.6% of women; it was more than once in 16.9% of them. In multipara women, the duration between previous and current

pregnancy exceeded one year in most of them (74.6%), 23.4% reported complications in the previous pregnancy and 20.7% had history of antenatal depression in previous pregnancies. Concerning the current pregnancy, complications were reported in 21.5% of the participants, gender of the newborn was undesired in only 4.6% of

them, most of them (77.5%) reported continuous husband and family support during pregnancy, 28.2% had other supports during pregnancy, History of chronic illness or depression was mentioned by 11.9% whereas family history of antenatal depression was reported among 11% of the participants. (Table 2)

**Table 2. Obstetric characteristics of the participants (n=136)**

Obstetric characteristics	Frequency	Percentage
<b>Gestational age</b>		
First trimester	24	17.6
Second trimester	33	24.3
Third trimester	79	58.1
<b>Regularly visiting primary health care</b>		
Yes	109	80.1
No	27	19.9
<b>Planning for pregnancy (n=135)</b>		
Planned	68	50.4
Not planned	67	49.6
<b>Number of previous pregnancies (n=135)</b>		
No	25	18.5
One	25	18.5
Two	26	19.3
Three	25	18.5
More than three	34	25.2
<b>History of previous abortion</b>		
No	82	60.3
Once	26	19.1
>once	28	20.6
<b>History of previous cesarean section</b>		
No	93	68.4
Once	20	14.7
>once	23	16.9
<b>In multipara women</b>		
-Duration between previous and current pregnancy (n=110)		
<year	14	12.7
Year	14	12.7
>one year	82	74.6
-Complications of previous pregnancies (n=111)		
No	85	76.6
Yes	26	23.4
-History of antenatal depression in previous pregnancies (n=111)		
No	88	79.3
Yes	23	20.7
<b>In the current pregnancy</b>		
-Complications in the current pregnancy (n=135)		
No	106	78.5
Yes	29	21.5
-Baby gender		
Girl	46	33.8
Boy	41	30.1
Don't know yet	49	36.0
-Is gender of the baby agonist your wish? (n=87)		
Yes	4	4.6
No	83	95.4
-Having family support, particularly from the husband? (n=135)		
Yes	104	77.5
Sometimes	25	18.6
No	6	4.4
-Having other support? (n=131)		
Yes	37	28.2
No	94	71.8
-History of chronic illness or depression (n=135)		
Yes	16	11.9
No	119	88.1
-Family history of antenatal depression		
Yes	15	11.0
No	119	87.5
Don't know	2	1.5

### 4.3. Prevalence of Antenatal Depression

Figure 1 shows that 41.2% of the women were at high risk for depression whereas 24.3% were at possible risk for depression.

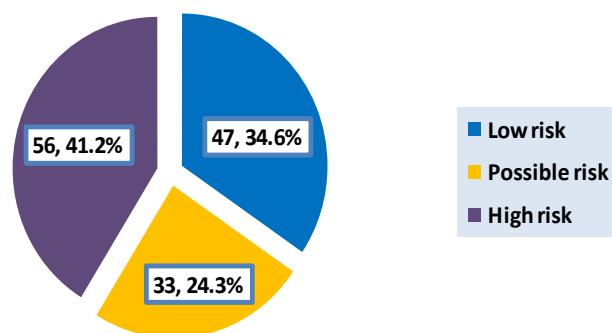


Figure 1. Prevalence of antenatal depression among the participants

### 4.4. Factors Associated with Antenatal Depression

#### 4.4.1. Socio-demographic Factors

Participants' house income was the only socio-demographic factor significantly associated with risk of antenatal depression as high risk was reported among 44.5% of women whose income was average whereas it was only 22.2% among those whose income was above average,  $p=0.012$ .

#### 4.4.2. Obstetric Factors

As demonstrated from Table 4, none of the studied obstetric factors (gestational age, regularly visiting primary healthcare, planning of pregnancy, number of previous pregnancies, history of previous abortion, and history of previous cesarean section) was significantly associated with the risk of antenatal depression.

#### 4.4.3. In Multipara Women

None of the multipara women obstetric factors was significantly associated with risk of antenatal depression (duration between previous and current pregnancy, complications of previous pregnancies and history of antenatal depression in previous pregnancies). (Table 5)

#### 4.4.4. In the Current Pregnancy

Almost one-third (36.5%) of women who have family support, particularly from the husband compared to 60% and 50% of those who had sometimes or no such support, respectively expressed higher risk for antenatal depression,  $p=0.007$ . Majority of women (80%) who reported family history of antenatal depression compared to 36.1% of those without such history had high risk antenatal depression,  $p=0.018$ . Other factors (complications in the current pregnancy, baby gender and if it is agonist woman's wish, having other support, and history of chronic illness or depression) were not significantly associated with antenatal depression.

Table 3. Socio-demographic factors associated with antenatal depression among the participants

	Risk of depression			p-value
	Low N=47 N (%)	Possible N=33 N (%)	High N=56 N (%)	
<b>Nationality</b>				
Saudi (n=111)	41 (36.9)	27 (24.3)	43 (38.7)	0.394*
Non-Saudi (n=25)	6 (24.0)	6 (24.0)	13 (52.0)	
<b>Age (years)</b>				
<b>Mean±SD</b>	32.1±6.3	30.1±5.7	30.7±6.3	0.332**
<b>Level of education (n=135)</b>				
Completed primary school (n=8)	4 (50.0)	0 (0.0)	4 (50.0)	0.340*
Completed intermediate school (n=9)	3 (33.3)	4 (44.4)	2 (22.2)	
Completed secondary school (n=44)	12 (27.3)	10 (22.7)	22 (50.0)	
Completed university (n=74)	27 (36.5)	19 (25.7)	28 (37.8)	
<b>Occupation (n=134)</b>				
Government employee (n=25)	10 (40.0)	6 (24.0)	9 (36.0)	0.602*
Private employee/Business women (n=6)	1 (16.7)	3 (50.0)	2 (33.3)	
House wife (n=103)	35 (34.0)	24 (23.3)	44 (42.7)	
<b>House income (n=128)</b>				
Below average (n=20)	5 (25.0)	9 (45.0)	6 (30.0)	0.012*
Average (n=99)	32 (32.3)	23 (23.2)	44 (44.5)	
Above average (n=9)	7 (77.8)	0 (0.0)	2 (22.2)	

\*Chi-square test, \*\*ANOVA test.

Table 4. Obstetric factors associated with antenatal depression among the participants

	Risk of depression			p-value*
	Low N=47 N (%)	Possible N=33 N (%)	High N=56 N (%)	
<b>Gestational age</b>				
First trimester (n=24)	6 (25.0)	10 (41.7)	8 (33.3)	0.144
Second trimester (n=33)	13 (39.4)	9 (27.3)	11 (33.3)	
Third trimester (n=79)	28 (35.4)	14 (17.7)	37 (46.8)	
<b>Regularly visiting primary health care</b>				
Yes (n=109)	37 (33.9)	28 (25.7)	44 (40.4)	0.739
No (n=27)	10 (37.0)	5 (18.5)	12 (44.4)	
<b>Planning for pregnancy (n=135)</b>				
Planned (n=68)	22 (32.4)	18 (26.5)	28 (41.2)	0.838
Not planned (n=67)	24 (35.8)	15 (22.4)	28 (41.8)	
<b>Number of previous pregnancies (n=135)</b>				
No (n=25)	11 (44.0)	6 (24.0)	8 (32.0)	0.857
One (n=25)	6 (24.0)	8 (32.0)	11 (44.0)	
Two (n=26)	8 (30.8)	7 (26.9)	11 (42.3)	
Three (n=25)	8 (32.0)	5 (20.0)	12 (48.0)	
More than three (n=34)	14 (41.2)	7 (20.6)	13 (38.2)	
<b>History of previous abortion</b>				
No (n=82)	29 (35.4)	20 (24.4)	33 (40.2)	0.859
Once (n=26)	8 (30.8)	8 (30.8)	10 (38.5)	
>once (n=28)	10 (35.7)	5 (17.9)	13 (46.4)	
<b>History of previous cesarean section</b>				
No (n=93)	36 (38.7)	19 (20.4)	38 (40.9)	0.271
Once (n=20)	3 (15.0)	7 (35.0)	10 (50.0)	
>once (n=23)	8 (34.8)	7 (30.4)	8 (34.8)	

\*Chi-square test.

Table 5. Factors associated with antenatal depression among multipara women

	Risk of depression			p-value*
	Low N=36 N (%)	Possible N=27 N (%)	High N=48 N (%)	
<b>Duration between previous and current pregnancy (n=110)</b>				
<year (n=14)	5 (35.7)	2 (14.3)	7 (50.0)	0.585
Year (n=14)	4 (28.6)	2 (14.3)	8 (57.1)	
>one year (n=82)	27 (33.0)	23 (28.0)	32 (39.0)	
<b>Complications of previous pregnancies (n=111)</b>				
No (n=85)	29 (34.1)	22 (25.9)	34 (40.0)	0.458
Yes (n=26)	7 (26.9)	5 (19.2)	14 (53.8)	
<b>History of antenatal depression in previous pregnancies (n=111)</b>				
No (n=88)	31 (35.2)	23 (26.1)	34 (38.6)	0.159
Yes (n=23)	5 (21.7)	4 (17.4)	14 (60.9)	

\*Chi-square test.

Table 6. Current pregnancy factors associated with antenatal depression among the participants

	Risk of depression			p-value*
	Low N=36 N (%)	Possible N=27 N (%)	High N=48 N (%)	
<b>Complications in the current pregnancy (n=135)</b>				
No (n=106)	36 (34.0)	28 (26.4)	42 (39.6)	0.360
Yes (n=29)	11 (37.9)	4 (13.8)	14 (48.3)	
<b>Baby gender</b>				
Girl (n=46)	19 (41.3)	9 (19.6)	18 (39.1)	0.706
Boy (n=41)	12 (29.3)	10 (24.4)	19 (46.3)	
Don't know yet (n=49)	16 (32.7)	14 (28.6)	19 (38.8)	
<b>Is gender of the baby agonist your wish? (n=87)</b>				
Yes (n=4)	1 (25.0)	0 (0.0)	3 (75.0)	0.352
No (n=83)	30 (36.1)	19 (22.9)	34 (41.0)	
<b>Having family support, particularly from the husband? (n=135)</b>				
Yes (n=104)	44 (42.3)	22 (21.2)	38 (36.5)	0.007
Sometimes (n=25)	1 (4.0)	9 (36.0)	15 (60.0)	
No (n=6)	1 (16.7)	2 (33.3)	3 (50.0)	
<b>Having other support? (n=131)</b>				
Yes (n=37)	16 (43.2)	7 (18.9)	14 (37.8)	0.319
No (n=94)	28 (29.8)	25 (26.6)	41 (43.6)	
<b>History of chronic illness or depression (n=135)</b>				
Yes (n=16)	5 (31.3)	5 (31.3)	6 (37.4)	0.796
No (n=119)	42 (35.3)	28 (23.5)	49 (41.2)	
<b>Family history of antenatal depression</b>				
Yes (n=15)	2 (13.3)	1 (6.7)	12 (80.0)	0.018
No (n=119)	45 (37.8)	31 (26.1)	43 (36.1)	
Don't know (n=2)	0 (0.0)	1 (50.0)	1 (50.0)	

\*Chi-square test.

## 5. Discussion

Antenatal depression could be a possible reason for serious adverse impacts on the mother (including post partum psychosis), her newborn, and family as a whole. [27] Despite of that, it is not enough studied in Saudi Arabia as a whole and in Makkah particularly. Therefore, this study was carried out to explore its magnitude and determinants in Makkah city as its early detection and proper management are very helpful in avoiding its postpartum adverse effects. [27,28]

In the present study, 41.2% of the women were at high risk for antenatal depression whereas 24.3% were at possible risk. This rate is lower than that reported in a study done in Riyadh using the same tool (54.5%). [18] Comparable results have been reported from Tanzania (39.5%) [29] and South Africa (39 and 39.5%). [30,31] However, it is higher than those reported in other similar Saudi studies carried out in Al-Ahsa City (31.9%) [32] and Eastern Province (26.8%). [33]

Additionally, rate of antenatal depression reported in this study is higher than those reported in other Arabia countries. For example in Oman, [34] the prevalence rate was 19% while in Jordan, [22] the rate was 24.3%. Also, the rate is higher than reported on international level. In

Northern Tanzania, [19] a rate of 24.9% has been reported, in Nigeria (22-24.5%), [35,36] and in Ethiopia (21.5% and 24.25%). [37,38] Regarding Asian countries, China reported a rate of 28.5%, [27] whereas in Malaysia, [39] a rate of 20% has been observed and in Bangladesh, a rate of 29% was reported. [40] In the United States of America, the prevalence rate was 16.6%. [41] The prevalence of depression was lowest in more developed countries, it was 5.6% in Japan and 7.7% in Sweden. [23] These variations between different studies and the present one should be interpreted with attention as they were use different tools to assess depression as well as there are variations in study design, women characteristics and study settings and time. However, since the rate is considered higher than those of majority of other studies, further investigation is recommended to clarify this finding as it has been reported that, antenatal depression is related to higher risk of upcoming depression of mothers as well as their offspring. [42]

In the present study, psychological and social factors that could lead to antenatal depression were not fully investigated, except the finding that having family support, particularly from husbands was a significant factor associated with lower risk for antenatal depression. The same has been confirmed by others. [18,37,43,44,45] Support from family members and husband might help

women to deal with stressful life situations efficiently through getting emotional and material, support during pregnancy. [37] Another Saudi study found that suffering problems, difficulty in sleeping, having a smoker husband, and having post-abortion psychological complications were significant predictors for antenatal depression. [32]

In the present study and in accordance with another Saudi study, [17] low income was significantly associated with antenatal depression. This could be attributed to its indirect association with social and psychological problems linked to low income. However, this finding is not confirmed by findings of others. [37]

Family history of antenatal depression was significantly associated with current antenatal depression. This could be attributed to the genetic and familial susceptibility to depression. Further study is needed to clarify this finding in details.

In accordance with others, [37] unplanned pregnancy was not associated with antenatal depression in this study. However, in disagreement with this, Rahman et al. [25] reported that unplanned pregnancy has two-fold risk for women to develop antenatal depression and also Alotaibe et al [18] reported that unplanned pregnancy was a risk factor for antenatal depression. Lancaster et al. showed that younger age and low education level were two risk factors of antenatal depression. [24] In another Saudi study, level of education, and employment history were predictors for antenatal depression. [18] In the current study, none of the studied socio-demographic factors, except the low income was significantly associated with antenatal depression.

Marital conflict was associated with antenatal depression as confirmed in some studies carried out in Ethiopia, [37,46,47] and Nigeria, [42] however, this issue was not investigated in the present study, despite of its importance.

In the present study, number of previous abortions was not significantly associated with history of antenatal depression. However, in studies carried out in Saudi Arabia, [17] Ethiopia, [37] systematic review carried out in low and lower-middle-income countries, [48] Brazil [49] and Bangladesh, [40] number of previous abortions was a significant determinant for antenatal depression.

Results of this study revealed no significant association between history of previous pregnancies/presence of complications and antenatal depression. In disagreement with this, others [37,30,49,50,51,52] reported an association between history of previous pregnancy complications and antenatal depression as women who bothered by complications in previous pregnancies could have psychosocial problems and fear of complications during the current pregnancy.

Another Saudi study reported some of the previous risk factors of antenatal depression in pregnant women including the level of education, and other additional risk factors including employment history, unplanned pregnancy and lack of partner support [18].

## 6. Strengths and Limitations

**Study strengths:** Up to our knowledge, this is the first study to investigate antenatal depression in Makkah and provides information about the prevalence and determinants

of the problem, which could have significance for decision makers.

**Study limitations:** The present study evaluated antenatal depression using the Edinburgh Postnatal Depression Scale (EPDS) which is considered a screening tool and not a diagnostic tool. Therefore, a score of  $\geq 12$  is only suggestive of depression and needs to be confirmed by a gold-standard clinical interview by a psychiatrist. The cross-sectional design of the study made it impossible to confirm the causal relationship between antenatal depression and possible associated factors. Finally, the study included only women attending antenatal care in primary healthcare settings; therefore, it is not practical to generalize the results over the entire population of pregnant women in Makkah.

## 7. Conclusion

Antenatal depression is a relatively common health problems encountered by pregnant women attending antenatal care at primary healthcare centers, Ministry of Health in Makkah city. Women with low house income, those with no family support, particularly from the husband and those having family history of antenatal depression were more likely to develop antenatal depression. None of obstetric factors was significantly associated with the risk of antenatal depression.

## 8. Recommendations

Based on the study results, the following are recommended:

1. Primary healthcare physicians should have a role in routine screening women attending antenatal care for depression and help them to deal with pregnancy stressful events.
2. Referral of cases with high risk of depression to psychologists and psychiatrists to confirm the diagnosis, have suitable care and prevent further complications.
3. Encourage family and husband support during pregnancy to reduce the risk of antenatal depression.
4. Further study included pregnant women from other healthcare facilities is recommended.

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