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Antenatal depression among teenage pregnant Mothers Baghdad, Iraq, 2023

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Abstract
Background: Depression is a global health problem and is considered one of the leading causes of disability adjusted life years (DALYs) worldwide and regionally. It is projected to become one of the top three causes of DALYs lost by 2030. The study aims to determine the prevalence of antenatal depression among pregnant teenage mothers in Baghdad, Iraq, and to identify the determinants of antenatal depression in pregnant teenage mothers.
Methods: In this study, a cross-sectional study with an analytic component design was conducted in ten randomly selected primary health care centers for family medicine in Baghdad after obtaining ethical approval to conduct the study. Data were collected using a direct interview questionnaire and the Edinburgh Postnatal Depression Scale (EPDS). A total of 304 pregnant teenagers were included in the study.
Results: The prevalence of antenatal depression among pregnant teenage mothers was 44.4%. Significant associations were found between antenatal depression and sociodemographic characteristics such as the older age of the mother's husband, low socioeconomic status, low literacy level, mother-of-the-housewife, and rural areas. Obstetric factors including the first months of pregnancy, the history of previous caesarean sections, and more complications during pregnancy were also significantly associated with antenatal depression. Additionally, a history of psychological and behavioral disorders such as smoking, exposure to domestic violence, and a personal and family history of psychological disorders showed significant associations with antenatal depression.
Conclusion: The study provides valuable information on the prevalence and determinants of antenatal depression among teenage pregnant mothers in Baghdad, Iraq. And the findings emphasize the need for comprehensive antenatal care programs in PHCCs that address the determinants of antenatal depression. By implementing these recommendations, healthcare professionals can improve the mental health outcomes of pregnant teenagers and their babies.

Keywords: Prevalence, antenatal depression, teenage pregnancy, PHCCs

Introduction
Depression is a significant global health problem and is considered one of the leading causes of Disability Adjusted Life Years (DALYs) lost worldwide and regionally. It is projected to become one of the top three causes of DALYs lost by 2030. Depression is characterized by symptoms such as low energy, sadness, loss of interest or pleasure, feelings of guilt or low self-worth, altered sleep/appetite, and poor concentration. It is also a major risk factor for suicide, particularly among adolescents and women of reproductive age. In light of these findings, depression has been identified as a priority condition for inclusion in the package of mental health services for integration in general health care [1].

Antenatal depression, also known as prenatal depression, is a form of clinical depression that can affect women during pregnancy. During pregnancy and the postpartum period, women experience an increased vulnerability to psychiatric disorders. Untreated antenatal depression can serve as a significant risk factor for the development of postpartum depression. It is estimated that 11% to 32% of pregnant mothers are affected by this condition [2].

Pregnancy is an important event in the life of a woman and is associated with psychological and biological changes. How antenatal care traditionally focuses more on physical health than emotional health. As a result, antenatal depression is often overlooked and underdiagnosed, both locally and globally. This is concerning because hormonal and lifestyle changes during pregnancy, including physical inactivity and weight gain, as well as

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awareness of the importance of antenatal care, can contribute to maternal depression, which can persist for many years after childbirth [3].

The prevalence of depression is higher among women compared to men, with younger women being more affected than middle-aged women. In fact, almost one in four women will experience depression at some point in their lives. Although postnatal depression has been extensively studied, there are limited national data on antenatal depression, especially among teenage mothers. The prevalence of depression during pregnancy is estimated to be between 11% and 32% [4].

Although postpartum depression has received a greater abundance of empirical evidence, a growing body of research suggests a significant association between prenatal depression and negative health outcomes for both mother and child. It places women at greater risk for inadequate prenatal care, alcohol and/or drug use, and poorer weight gain, all of which can affect the unborn fetus. Research has shown that women with depression during pregnancy are at increased risk of preterm birth and low birth weight. Antenatal depression is also a strong predictor of postnatal depression, which can affect infant feeding and care. Furthermore, children born to mothers with antenatal depression are more likely to develop depression during adolescence [5].

Teenage marriage and pregnancy have been widely recognized as public health issues in Iraq. These events are often associated with academic failure, socioeconomic deprivation, and adverse infant outcomes such as low birth weight, prematurity, and infant death. It is important to identify risk factors for elevated depression during pregnancy, especially among teenage mothers, to effectively target screening efforts. Previous studies have identified a personal and family history of mood disorders, marital conflict, younger age, limited social support, and a higher number of children as risk factors for depression during pregnancy. Substance abuse has also been found to be significantly associated with antenatal depression [6, 7].

The rationale for this study is based on several factors. Firstly, there has been an increase in early marriages and subsequent early pregnancies among teenage girls in Iraq, which has significant impacts on their health and psychological well-being. Second, depression during pregnancy can have negative outcomes for both the mother and the child, regardless of age. Third, there is a lack of studies that examine the effects of maternal depressive symptoms specifically among teenage mothers. Therefore, recognizing the extent of the problem and identifying the determinants of depression during pregnancy, particularly among teenage mothers, is crucial to the development of effective intervention programs to reduce the morbid consequences. Lastly, implementing policies for the detection and effective management of depression during pregnancy would not only benefit pregnant mothers, but also contribute to the physical and mental well-being of their offspring, ultimately reducing the burden on families.

Objectives of the study
1. Measure the prevalence of antenatal depression among teenage pregnant mothers.
2. Assess the determinants of antenatal depression among teenage pregnant mothers.

Methodology
Study design: A cross-sectional study with an analytical component design was used. This design allowed data collection at a single point in time, providing a snapshot of the population being studied.

Study Setting: The study was carried out in 10 randomly selected primary health care centers in Baghdad that adopt a family medicine approach. These centers provide antenatal care to pregnant mothers, which are documented in their records. The records include sociodemographic characteristics, physical measurements, vaccination status, dental care, investigations, risk assessment, and prescribed supplements and medications. Pregnant mothers receive an appointment card that includes the necessary information and the time of their next visit.

Study Population: The study population included all pregnant mothers with an age below 19 years in their second or third trimester of pregnancy who attended primary healthcare services during the defined study period and satisfied the established eligibility criteria.

The inclusion criteria included pregnant mothers with an age below 19 years in their 2nd or 3rd trimester according to their last menstrual period.

Exclusion criteria included pregnant mothers with a history of chronic diseases, a recent history of psychological trauma, multiple pregnancies, and diagnosed physical or learning disabilities.

Sample size
Globally, the estimated prevalence of depression during pregnancy was between 10-20% [8]. Here is the formula that is used to calculate the sample size:

Sample size (n) = $(Z^2 * p * (1-p)) / d^2$
- Z score = 1.96.
- p = 0.20.
- d margin of error = 0.05.

n = $(1.96^2 * 0.2 * (1 - 0.2)) / (0.05^2) \approx 245.86$

This calculation suggests a sample size of approximately 246.

To increase the power of our study, a total of 304 teenage pregnant mothers participated in this study.

Sampling technique
Ten family medicine health centers were randomly selected from the centers that adopt a family medicine approach in Baghdad. During the data collection period, all pregnant mothers attending the selected primary health care centers who met the selection criteria were included in the study (convenient sample).

Data Collection Tools
Data were collected using a questionnaire and the Edinburgh Postnatal Depression Scale (EPDS), which is considered a gold standard and is the most commonly self-rated scale used [9]. The questionnaire was designed based on existing assessment tools in similar published studies, discussions with supervisors, and revision by national experts in community medicine, psychiatry/mental health, and gynecology. The questionnaire collected information on sociodemographic characteristics, obstetric history, history of psychological and behavioral disorders, and antenatal

depression. EPDS is a 10-item self-report questionnaire used to detect prenatal and postnatal depression. The questionnaire was administered through face-to-face interviews with pregnant mothers. A score of ≥ 12 was used as the cut-off point to distinguish cases from non-cases.

Data Management and Statistical Analysis
Data were coded and entered on a computer using the Minitab (17) software version for data management and statistical analysis. Frequency tables and graphs were generated to summarize the data. A significance chi-square test was performed to assess the association between different variables and a p-value of ≤ 0.05 was considered significant.

Official and ethical approvals
Official and ethical approvals were obtained from the scientific board of the ethics committee of community medicine. Permission was also obtained from the Iraqi Ministry of Health and the Supervising Committee of the Arab Board of Health Specializations. Communication was carried out with the Baghdad Health Directorate to obtain their permission to conduct the study in the selected primary health care centers. Written informed consent was obtained from each participant and data were collected anonymously to ensure confidentiality.

Data availability
Due to ethical considerations and privacy concerns, individual participant data cannot be publicly shared.

Results
Distribution of the study sample by basic characteristics
A total of 304 teenage pregnant mothers participated in this study. In terms of age of the participants, 72% belonged to the age group of 16- 18 years, 28% were under 16 years old, and the mean age of the participants was 16.6 (±1.4) years. For the age of the husbands, 51% belonged to the age group of 30-50 years, 33.9% were younger than 30 years and 15.1% were older than 50 years. Regarding socioeconomic status, 49.3% of pregnant mothers had low socioeconomic status, followed by 33.3% with medium socioeconomic status, and only 17.4% had high socioeconomic status.
In terms of literacy level, nearly 39% of pregnant mothers had the ability to read and write, 37.8% completed primary education and 23% had secondary levels of education. Most of the pregnant mothers (81.9%) were housewives, while the remaining 18.1% were employed. Most of the participants (70.1%) lived in urban areas, while 29.9% lived in rural areas.
Regarding the history of psychological and behavioral disorders, most of the pregnant mothers (82.9%) were non-smokers, 17.1% were ex-smokers, and none of the participants reported smoking during pregnancy. 34.2% of pregnant mothers were found to have experienced exposure to domestic violence. The results also showed that 12.8% had a personal history and 9.5% had a family history of psychological disorders.

Distribution of the study sample according to the obstetric history
For the characteristics of the obstetric history of the enrolled pregnant mothers, 59.2% were in their second trimester and 40.8% were in their third trimester.

In terms of parity, 51.6% were primi and 48.4% were multipara. The type of previous delivery showed that 53.1% of pregnant mothers had a caesarean section, 46.9% had a normal delivery. Most mothers (72.7%) knew the sex of their fetus, 40.1% had a female fetus, and 27.3% did not know the sex.
Regarding antenatal care, 57.2% of pregnant mothers had irregular antenatal care, while 42.8% had regular antenatal care. In terms of complications during pregnancy, 71.4% had one complication, 28.6% had more than one complication. For subfertility, 22.7% had primary subfertility and 77.3% had no history of subfertility. Almost half (51%) of pregnancies were planned.

The prevalence of antenatal depression in teenage pregnant mothers
A total of 135 teenager pregnant mothers participated in this study and were distinguished as cases of depression according to the EPDS scale. Therefore, the prevalence of antenatal depression among pregnant teenage mothers in this study was 44.4%.

The association of antenatal depression with sociodemographic characteristics (Table 1)
The study showed a significant association between antenatal depression and the younger age groups of pregnant mothers (p=0.001). Although antenatal depression among pregnant teenage mothers had a significant association with the older age of the husband, reaching 60.9% among those with husbands older than 50 years (p=0.001).
In terms of socioeconomic status, more than half (55.3%) of pregnant teenage mothers with low socioeconomic status had antenatal depression, while the percentage decreased with improved socioeconomic status. The association was highly significant (p=0.000). The percentage of antenatal depression was higher among those with a lower level of literacy compared to those with secondary levels of education, achieving a significant association (p=0.003).
In terms of occupation, antenatal depression was higher among housewives of teenage pregnant mothers compared to employing (48.2% and 27.3%, respectively). A significant association was found between antenatal depression and the occupation of pregnant mothers (p=0.005). Regarding residence, more than half (53.9%) of pregnant mothers in the rural area had antenatal depression, while 40.4% of those in the urban areas had antenatal depression. The relationship showed a significant association (p=0.03).

The association of antenatal depression with a history of psychological and behavioral disorders (Table 2)
Those pregnant mothers who were enrolled did not report their current smoking status. Ex-smokers showed a higher percentage of antenatal depression (67.3%) compared to nonsmokers (39.7%). The association of antenatal depression and a history of smoking was significant (p=0.000).
Antenatal depression showed a significant association with a history of exposure of teenage pregnant mothers to domestic violence (p=0.001). And teenage pregnant mothers with a personal history of psychological disorders were more likely to develop antenatal depression (64.1%) than others (41.5%), and it is a significant association (p=0.008).

A similar situation with a family history of psychological disorders was detected among adolescents (p = 0.016).

The association of antenatal depression with obstetric history (Table 3)
The study showed that among pregnant teenage mothers, antenatal depression was found in 46.1% of those in their second trimester and 41.9% of those in their third trimester, with no significant association between antenatal depression and gestational age (p=0.471). In terms of parity, half of the first adolescent (50.3%) had antenatal depression, compared to approximately one third of multipara pregnant mothers (38.1%), showing a significant association (p=0.032). Taking into account the type of previous delivery, antenatal depression was significantly higher among those with a history of caesarean section (46.1%) compared to those with a history of normal delivery (29.0%) (p=0.032).

Although antenatal depression was higher among pregnant teenage mothers who had a male fetus (49.5%) compared to a female fetus (36.1%) or unknown fetus sex (50.6%), the relationship did not reach significance (p=0.056). Regarding prenatal care, prenatal depression was higher among pregnant mothers who had irregular prenatal care than among those with regular care (52.9% and 33.1%, respectively). The association between antenatal depression and antenatal care was significant (p=0.001).

Pregnant mothers with more than one complication showed a higher percentage of antenatal depression (56.3%) compared to those with one complication (39.6%). A significant association was shown (p=0.008). There was no significant association between antenatal depression and a history of subfertility among pregnant teenage mothers (p=0.14). And antenatal depression was significantly associated with planning for pregnancy (p=0.012). It was found to be more common among unplanned pregnancies compared to planned pregnancies (51.7% and 37.4%, respectively).

Discussion
This study aimed to investigate the prevalence of antenatal depression among pregnant teenagers and the factors associated with it. The findings revealed a high prevalence of antenatal depression (44.4%) among pregnant teenage mothers in Iraq. This prevalence is consistent with similar studies conducted in other Middle Eastern countries, such as Saudi Arabia, where rates of antenatal depression were also found to be high [10]. On the contrary, developed nations reported significantly lower rates of antenatal depression, indicating a global disparity that may be influenced by socioeconomic factors [11, 12].

The study found that pregnant teenagers had a higher prevalence of antenatal depression compared to adult mothers and non-pregnant peers. This finding is consistent with existing research that has consistently shown a negative association between maternal age and depression [13, 14]. Older mothers often benefit from social and economic advantages, such as financial security and stable relationships, which act as protective factors against depression [15].

Several sociodemographic characteristics were significantly associated with antenatal depression among teenage mothers. The age of the husband was found to have a significant association with antenatal depression, with a higher prevalence among pregnant teenagers whose husbands were older than 50 years. This finding highlights the potential role of power dynamics and age disparities within relationships in contributing to antenatal depression [16, 17].

Socioeconomic status was also found to be significantly associated with antenatal depression, with a higher prevalence among pregnant teenagers from low socioeconomic background. This aligns with previous research that indicates that socioeconomic disadvantages are risk factors for antenatal depression [18, 19]. Education level was another significant factor, with lower educational attainment being associated with a higher risk of depression during pregnancy. This finding is consistent with previous studies that have identified young age and low education as risk factors for antenatal depression [18, 19].

Residence was also found to be associated with antenatal depression, with a higher prevalence among pregnant teenagers who reside in rural areas. This finding aligns with research carried out in Bangladesh, which identified factors such as large age gaps between partners, limited resources, and limited decision-making power for women as contributors to depression in rural areas [20, 21].

The study also examined the obstetric history as a factor associated with antenatal depression among teenage mothers. A history of caesarean section was found to be significantly associated with antenatal depression, possibly due to fear of a repeat procedure and previous experiences of depression [22, 23]. However, no significant association was found between gestational age and depression, contrary to some previous findings [24].

Parity was also found to be associated with antenatal depression, with first-time teenage mothers (primi) being more susceptible to depression compared to those with previous pregnancies (multipara). This could be attributed to the stress of a first pregnancy [25]. Fetal sex, on the other hand, did not show a significant association with depression in teenage mothers [26].

Access to quality antenatal care was found to be a protective factor against depression, with regular visits and support from healthcare providers potentially reducing the risk of depression [23]. Pregnancy complications were also found to be associated with antenatal depression, likely due to the fear of losing the baby [27]. However, no significant association was found between a history of subfertility and depression in teenage mothers [27].

Mental and behavioral factors were also examined in relation to antenatal depression among teenage mothers. Smoking was found to be a significant risk factor for depression in both teenage groups, highlighting the importance of addressing smoking cessation during pregnancy [28]. A history of domestic violence was also found to significantly increase the risk of depression, likely due to the psychological trauma experienced [29]. Furthermore, a personal or family history of mental health disorders was associated with a higher risk of depression in teenage mothers [30].

Conclusion and Recommends
The study focusing on a specific at-risk population and including a large sample size, and highlighted the effects of maternal depressive symptoms among teenage mothers, and recognition of the size of the problem and identification of determinants of depression during pregnancy will contribute to the development of intervention programs to reduce

morbid consequences. It highlights a high prevalence of antenatal depression (44.4%) among pregnant teenage mothers in Baghdad. Several factors significantly contribute to an increased risk, including: (Older age of the mother's husband, Low socioeconomic status and education level, Housewife status, Rural residence, Prim parity, Caesarean section history, Irregular antenatal care, Multiple pregnancy complications, Smoking history, Exposure to domestic violence, and personal or family history of psychological disorders).

These findings emphasize the need for comprehensive antenatal care programs in PHCCs that address these risk factors and offer the following: (universal screening for antenatal depression among teenage mothers, interventions and support services for those identified, customized programs to address social and economic disadvantages, mental health services for mothers with a history of psychological disorders or domestic violence, and smoking cessation programs for pregnant women). By implementing these recommendations, healthcare professionals can improve the mental health outcomes of pregnant teenagers and their babies. And further research is recommended to explore the effectiveness of specific interventions, the cultural context of antenatal depression in this population, and potential long-term impacts on mothers and children.

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Conflict of interest
Author Rana Faeq Saud and co-authors Muthana Abdulrazzaq Jabbar, Riyadh Sh. Al- Rudaini, and Jawad K. Al-Diwan declare no conflict of interest with respect to the publication of this article.

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