Prevalence and risk factors of depressive symptoms in low-risk pregnancy

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Objective
To demonstrate the prevalence and risk factors of antenatal depression among low-risk pregnant women residing in Assiut, Egypt.

Patients and methods
A total of 100 pregnant women were recruited from primary health centers who met the inclusion criteria, and they were evaluated using the Arabic version of the validated Edinburgh Postnatal Depression Symptoms (EPDS) questionnaire before and after 20 weeks of pregnancy. Women who scored EPDS more than or equal to 13 were subjected to the Arabic version of Beck Depression Inventory to evaluate the severity of depressive symptoms. Correlations were made with demographic and obstetric risk factors.

Results
Overall, 18% scored EDPS more than or equal to 13 at the first visit compared with 32% at the second visit. In the first visit, two women were classified by Beck Depression Inventory as severe (11%), nine women as moderate (50%), and seven as mild (38.9%). At the second visit, six women were classified as severe (18%), 20 as moderate (62%), and six as mild (18%). Age, presence of husband, socioeconomic state, living at family home proved statistically significantly associated with depressive symptoms. Moreover, parity, unwanted pregnancy, known female fetus, and number of living female offsprings proved statistically significantly associated with depressive symptoms. There was a significant relationship between EPDS in first visit and EPDS in second visit. Logistic regression analysis showed that age, low socioeconomic level, unwanted pregnancy, and number of living female offsprings were positive predictors of antenatal depression, but the association lacked statistical significance.

Conclusion
Depressive symptoms are common in second half of the pregnancy. Age, socioeconomic level, absence of husband, parity, unwanted pregnancy, and number of living female offsprings are risk factors for depressive symptoms during pregnancy.

Keywords:
depression, antenatal, pregnancy, EPDS, prevalence

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Introduction

The prevalence of depression during pregnancy is variable. In high-income countries, the prevalence of depression during pregnancy ranges from 7 to 20% [1–3], whereas it is 20% or more in low-income and middle-income countries [4–6]. This difference may be owing to different population characteristics, study tools, and cutoff values for diagnosis [1]. Untreated antenatal depression may be associated with a 50–60% risk of postpartum depressive symptoms. Up to 50% of cases of antenatal depression are not diagnosed, thus exposing those women to complications affecting both the mother and developing fetus, including preterm labor, intrauterine growth restriction, low birth weight ([7]), spontaneous abortion [8], and pre-eclampsia [9]. Maki *et al.*[10] and Pearson *et al.*[11] also demonstrated that during adolescence, an independent association exists between maternal antenatal mood symptoms, offspring depression, and an increased risk of criminal behavior in sons.

The prevalence and risk factors of antenatal depression in our community was not adequately studied. A study in Saudi Arabia showed that the prevalence rates of antenatal depression in Saudi women were 18.6, 11.7, and 6.6%, respectively, according to the three trimesters of pregnancy [12].

To gain better understanding of antenatal depressive symptoms in our community, this study was designed to

assess the prevalence and severity of antenatal depressive symptoms in women with low-risk pregnancy. The contributing demographics and obstetric risk factors associated with antenatal depressive symptoms were also assessed.

Patients and methods

The study followed a prospective design. Eligible women were recruited from the maternal and child health units of Al Awamer-Abnub and Firyal, Assiut, Egypt. These units provide antenatal care services for low-risk pregnancy. High-risk pregnancy is referred to district hospitals.

Women were included if they had low-risk pregnancy and presented before 20 weeks of pregnancy. Women with high-risk pregnancy, history of psychiatric problems before pregnancy, or women presenting for the first time after 20 weeks of gestation were excluded.

Basic demographic and obstetric data were taken. This included age, marital duration, presence of husband, education, and living with husband's family or not. Socioeconomic status was classified according to the model of Ministry of Health and Population into low (0–7), middle (7–14), and high (≥15).

Obstetric data included first day of the last menstrual period and obstetric history. Number of living children (males or females) was also assessed. Women were asked whether pregnancy was planned or unwanted. Previous history of premenstrual dysphonic symptoms was recorded. Women were asked whether they knew the fetal sex. If they answered yes, they were asked whether the baby was a boy or a girl.

All women were subjected to the Arabic version of the Edinburgh Postnatal Depression Symptoms (EPDS) Ghubash *et al.* [13], by the investigator as many of the women do not read or write. The EPDS is a 10-item questionnaire. Items of the scale correspond to various clinical depression symptoms, such as guilt feeling, sleep disturbance, low energy, and suicidal ideation. Overall assessment was done by total score, which was determined by adding together the scores for each of the 10 items. Higher scores indicate more depressive symptoms. The EPDS was confirmed as a valid measure for detecting depression in a pregnant population [14].

Women were subjected to EDPS twice: the first before and the second after 20 weeks of pregnancy. Women who had score more than or equal to 13 were subjected to the Arabic version of Beck Depression Inventory-II (BDI-II) [13]. The BDI-II addresses all nine of the symptom criteria listed for a major depressive episode in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. DSM-IV; 1994). The scale was shown to be valid in pregnant and postnatal women [15]. The BDI-II is a 21-item inventory that assesses the severity of depressive symptomatology and also covers affective, cognitive, motivational, and physiological areas of depressive symptomatology. BDI was classified into 0–13 (minimal), 14–19 (mild), 20–28 (moderate), and 29–63 (severe). Women who scored more than 28 in BDI or expressed suicidal or homicidal tendency were referred to mental health hospital with a referral letter.

Ethical issues

The study protocol was approved by the local ethics committee of Faculty of Medicine, Assiut University. The main issues were anonymity (clients coded by number given to the client to present in the second visit) and confidentiality, which were ensured, and a written informed consent was obtained from all participants.

Sample size

All eligible women who attended the antenatal care unit from July 2016 up to February 2018 were included.

Statistical analysis

The statistical analysis was performed using SPSS, version 16. Prevalence of depression in each visit was calculated. Statistical significance of different risk factors in women with versus women without depressive symptoms was assessed using independent sample *t* test or χ^2 (Fisher exact) test as appropriate. Independent effect of statistically significant risk factor was assessed by binary logistic regression.

Results

The study included 118 pregnant women. Of them, 14 women were excluded owing to refusing to complete the questionnaire at the second visit, and four required termination before completing the second visit questionnaire (two had stillbirth and two had rupture of membranes). Data was available for 100 women.

Baseline characteristics

The mean ± SD age of the participants at the time of the study was 28.16 ± 0.2 years. The mean ± SD number of pregnancy of the participants was 2.90 ± 1.74). The mean ± SD of number of deliveries of the participants was 1.47 ± 1.48. A total of 29 pregnant women had

a history of abortion, five with history of ectopic pregnancy, and three women had history of preterm labor. Moreover, 79 women knew the fetal sex, and in 52, it was a female fetus. The mean ± SD of gestational age at the first visit was 11.6 + 4.6 weeks with a range between 5 and 19 weeks. The mean ± SD gestational age for the second visit was 28.9 ± 5.3 weeks. The rest of baseline characteristics are presented in Table 1.

Table 1 Basic characteristics of the study population (*n*=100)

Characteristics	*n*=100 (%)
Education	5
Illiterate	16
Write and read	14
Primary or preparatory secondary	21
University or above	44
Occupation	
Housewife	64
Laborer	5
Clerical work	9
Administrative work	22
Socioeconomic status	
Low	2
Middle	59
High	18
Husband's presence	
Nonresident	3
Travels	14
Resident	83
Living in a family home	
Yes	62
No	38
Planned pregnancy	
Yes	77
No	23

Depressive symptoms in the study group

The prevalence of women with score of EDPS more than or equal to 13 at the first visit was 18%. At first visit, two (11.1%) women were classified by BDI as having severe symptoms, nine (50%) women had moderate symptoms, and seven (38.9%) had mild depression. In the second visit, 32% of women had a score of EDPS more than or equal to 13; six (18.75%) women had mild symptoms, 20 (62.5%) women had moderate symptoms, and six (18.75%) women had severe depression. There was a significant relationship between EPDS in first visit and EPDS in second visit by paired sample *t* test ($P = 0.004$).

Risk factors for antenatal depression in the study population

Among demographic risk factors, higher age, absence of husband, and low socioeconomic state proved statistically significantly higher in women with depressive symptoms in the first and second visits (Table 2). Among obstetric risk factors, parity, unwanted pregnancy, knowing the sex as female, and number of living female offsprings proved statistically significantly higher in women with depressive symptoms in the first and second visits (Table 3).

Demographic predictors of antenatal depression

Binary logistic regression of the demographic variables that were significantly different in women with EPDS score more than 13 in the first and second visits was done. The socioeconomic state, living at family home, absence of husband, unwanted pregnancy, and the number of living female offsprings increased the risk, but none achieved statistical significance.

Cases with severe depression (Beck Depression Inventory >28) or with suicidal tendency

There were six women with severe depression, in whom, three had suicidal tendency.

Two women had severe symptoms in first visit and second visit, and four cases had symptoms only in the second visit.

Women who had severe symptoms in both visits were below 20 years of age. Women who had severe symptoms in the second visit only were more than or equal to 35 year and low or middle socioeconomic level and had more than or equal to 3 living female offsprings and knew that the fetal sex was female.

Discussion

The study revealed that 18% of women had depressive symptoms in the first half of pregnancy of whom 11% were rated as severe by BDI-II score. In the second half, 32% had depressive symptoms, of whom, 18% were rated as severe. Demographic risk factors of significance were age, absence of husband, and low socioeconomic state, whereas obstetric risk factors of significance were parity, unwanted pregnancy, being pregnant with a female child, and higher number of living female offsprings. Presence of depressive symptoms in the first half was significantly associated with the presence of depressive symptoms in the second half. None of the factors could significantly predict the presence of depressive symptoms.

The study has the following strengths. It is the first study in this population of Upper Egyptian women who attended antenatal care with low-risk pregnancy. The study had a longitudinal approach. An account of many of the demographic and obstetric risk factors was taken. The study also used validated instruments for assessing depressive symptoms (EPDS) and its severity (BDI-II).

However, the study has some limitations. Time pressure has resulted in including a small sample

Table 2 Demographic difference between women who scored more than or equal to 13and less than 13 in Edinburgh Postnatal Depression Symptoms

Characteristic	First visit		*P*	Second visit		*P*
	Women with EPDS <13 (*n*=82)	Women with EPDS ≥13 (*n*=18)		Women with EPDS <13 (*n*=68)	Women with EPDS ≥13 (*n*=32)	
Age (mean±SD)	27.4±5.9	31.3±7.08	0.014*	27.2±5.8	30.0±6.8	0.034*
Education						0.111
Illiterate	4	1	0.217	3	2	
Write and read	12	4		9	7	
Primary or preparatory	11	3		9	5	
Secondary	16	5		13	8	
University or above	39	5		34	10	
Occupation						0.023**
Housewife	51	13	0.103	39	25	
Laborer	3	2		3	2	
Written work	8	1		7	2	
Administrative work	20	2		19	3	
Socioeconomic status			0.033**			0.000**
Low	1	2		0	3	
Middle	58	14		45	27	
High	23	2		23	2	
Husband's presence			0.000**			0.011**
Nonresident	2	1		1	2	
Travels	7	8		6	8	
Resident	74	9		61	22	
Living in a family home			0.103			0.051**
Yes	48	14		38	24	
Planned pregnancy	69	8	0.001**	58	19	0.005**

EPDS, Edinburgh Postnatal Depression Symptoms. *Independent sample *t* test. **χ^2 test.

Table 3 Obstetric difference between women who scored more than or equal to 13and less than 13 in Edinburgh Postnatal Depression Symptoms (first and second visits)

Characteristic	Women with EPDS <13 (*n*=82)	Women with EPDS ≥13 (*n*=18)	*P*	Women with EPDS <13 (*n*=68)	Women with EPDS ≥13 (*n*=32)	*P*
Parity	2.65±1.6	4.06±1.7	0.002*	2.43±1.509	3.91±1.785	0.000*
Sex female (1)	40	12	0.073**	32	20	0.025**
Number of living female offsprings			0.007*			0.000*
0	53	7		47	13	
1	19	6		16	9	
2	8	2		4	6	
3	1	2		1	2	
4	1	0		0	1	
6	0	1		0	1	

EPDS, Edinburgh Postnatal Depression Symptoms. *Independent sample *t* test. **χ^2 test.

size. There were several women with missing data because they did not attend the second visit, so they were excluded. The questioning in two visits only before and after 20 weeks of pregnancy instead of each trimester has resulted in missing the association between depressive symptoms and which trimester of pregnancy was accompanying.

The likelihood of increasing depressive symptoms in women with lower socioeconomic class is in agreement with Lee *et al.* [2], and Leigh and Milgrom[16] but not with the systematic review by Lancaster *et al.* [17]. This may be owing to different tools and scores for socioeconomic assessment.

Regarding the age, the positive association between age and the presence of depressive symptoms was also reported by Luke *et al.* [18]. However, other studies reported that age decreases the risk of antenatal depression [19,20]. The difference in results may be attributed to different population characteristics or a possible interaction of other factors such as parity and unwanted pregnancy. On another note, the fact that the two women who were younger than 20 years reported severe depressive symptoms requires further study in adolescent pregnant women.

The fact that absence of husband increased the possibility of having depressive symptoms was also

reported by Collins N, *et al*. [21]. Thus, the social history is important in antenatal care where women with absent or frequently traveling husband need more observation for depressive symptoms.

The association of high parity with antenatal depressive symptoms was reported by Jesse and Swanson (2007) [22]. Other studies, for example, Pajulo *et al.* [23], found parity to be nonsignificant as a risk factor. This may be owing to different population characteristics and the differential desired family size in different studies. This information should be added to the counseling of women to encourage use of family planning. This is also supported by the positive association between depressive symptoms and unwanted pregnancy. Data of the current study concur with the systematic review by Lancaster *et al.*[17] who identified six studies that showed a relationship between antenatal depressive symptoms and an unwanted pregnancy.

The number of living female offsprings was a statistically significant predictor for depressive symptoms in this study. This was not assessed in other studies. However, it was reported that women who were told that they have a fetus of undesired sex reported significantly higher scores of somatization, depression, anxiety, hostility, and phobia than those women proven to have the desired fetal sex [24].

As this study demonstrated that the prevalence of depressive symptoms in pregnant women at first visit was 18% and at the second visit was 32%, it is imperative that healthcare professionals screen patients at least once during the perinatal period for depression symptoms using a standardized, validated tool. Women with current depression or anxiety, a history of perinatal mood disorders, or risk factors for perinatal mood disorders warrant particularly close monitoring, evaluation, and assessment. Further research on the effect of depression on a child's emotional, social, cognitive, and intellectual development is needed, as treatment for depression and anxiety could prevent these possible adverse outcomes.

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Conflicts of interest
There are no conflicts of interest.

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