

# Prevalence of psychiatric disorders and associated risk factors in women during their postpartum period: a major public health problem and global comparison

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**Background:** Postnatal depression has received considerable research and clinical attention; however, anxiety and stress in postpartum women have been relatively neglected.

**Objective:** The aim of this study was to determine the prevalence of depression, anxiety, and stress during the postpartum period of women using the Depression Anxiety Stress Scales, and to examine the associated correlates of these conditions.

**Design:** This was a cross-sectional study conducted from January 2010 to May 2011.

**Setting:** Primary health care centers of the State of Qatar Supreme Council of Health.

**Subjects:** A representative sample of 2091 women who attended primary health care centers was surveyed. From this sample, 1659 women (79.3%) consented to participate in the study.

**Methods:** The study was based on a face-to-face interview using a designed questionnaire covering sociodemographic characteristics, family history, medical history, the obstetric variables of patients, and stressful life events. Depression, anxiety, and stress were measured using the Depression Anxiety Stress Scales.

**Results:** In the study sample, the prevalence of depression, anxiety, and stress was 18.6%, 13.1%, and 8.7%, respectively. Young mothers and those with higher education (above secondary level) were more depressed (35.7% and 67.5%, respectively), anxious (34.9% and 68.3%, respectively), and under stress (29.7% and 62.1%, respectively) in their postpartum period. Postpartum working women were more stressed (60.7%) and anxious (51.8%), while housewives were more depressed (51.6%). Nearly half of the depressed mothers reported experiencing more than one stressful life event in their postpartum period, such as low income (41.9%;  $P = 0.05$ ) or unplanned pregnancy (60.4%;  $P < 0.001$ ). Unplanned pregnancy (OR = 1.9;  $P < 0.001$ ) was the major significant correlate for postpartum depression, while a lack of family support (OR = 1.9;  $P < 0.001$ ) was the major significant correlate for postpartum anxiety. For stress, being an older mother aged from 40 to 45 years of age (OR = 2.0;  $P = 0.04$ ) and having dissatisfaction in married life (OR = 1.9;  $P = 0.006$ ) were the significant correlates.

**Conclusion:** The study found clearly defined groups of women at risk for postpartum depression, anxiety, and stress. There was a marked association between stressful life events and postpartum depression, anxiety, and stress disorders.

**Keywords:** prevalence, obstetric risks, Qatar, depression, postpartum

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## Introduction

The postpartum period represents one of the most important life stages in which the accurate detection and treatment of psychological distress is required. The transition to new motherhood has been associated with emotional distress in up to 30% of women.<sup>1</sup>

It involves changes in relationships between couples and within families, and is commonly a cause of additional financial stress, even among households with relatively high incomes. The impact of stressful life events and social health issues on maternal psychological morbidity such as depression, anxiety, and stress has been identified in several studies.<sup>2,3</sup> It is widely acknowledged that symptoms of depression and anxiety co-occur and that this comorbidity may be an indicator of the severity of psychological distress.<sup>4</sup>

O'Hara and Swain<sup>5</sup> pointed to the importance of distinguishing between depression and anxiety in postnatal periods in order to provide appropriate treatments that specifically target the symptoms and etiology of anxiety. It was suggested that anxiety may be a precursor to depression as a result of altered physiological pathways, or from the consequences of failing to manage stress.<sup>6</sup> Stress is a distinct negative emotional state that involves chronic arousal and impaired functions.<sup>7</sup> A study by Glasheen et al<sup>8</sup> of maternal postnatal psychological distress suggests that exposure is related to adverse psychological problems in children.

Maternity care in Qatar has improved remarkably in the last decade. The main goal of the Maternal and Child Health Section of the Primary Health Care department is to improve the health of mothers and children within the primary care setting through the provision of quality health care. They make sure that mothers and children enjoy the highest standard of physical, mental, and social well-being. Infant mortality, neonatal mortality, and postneonatal mortality rates have declined considerably compared to previous years, and the rates are much lower than the global target value set by the World Health Organization. No maternal deaths have been encountered annually. Despite these improvements, however, significant deficits in the provision of basic maternity services remain. Poor understanding, a lack of health education, and poor health behavior advice have been noted. There is a dearth of studies related to pregnancy, childbirth, and the postpartum experiences of women from Middle Eastern countries. The impact of mental health problems is one of the main causes of morbidity in our societies. It is important to identify the symptoms of each negative affective state in the postpartum period, in order to identify women who might be distressed. The Depression Anxiety Stress Scale (DASS)<sup>9</sup> has been found to be a reliable instrument for distinguishing between the symptoms of depression, anxiety, and stress in both nonclinical and clinical samples. In the present study, the 21-item DASS (DASS-21) was selected to identify these three negative emotional states as separate phenomena. Using this instrument, the study aimed to

determine the prevalence of depression, anxiety, and stress in postpartum women, and to examine the associated factors of these psychiatric disorders.

## Subjects and methods

This was a cross-sectional study that included Arab women within 6 months of the postnatal period who attended primary health care centers. In order to support primary health care, 22 health centers were established covering all of the districts of Qatar. Every health center provides primary health care services to the people in the surrounding catchment areas. Antenatal programs in health centers take care of pregnant women until they reach 28 weeks of pregnancy. All deliveries take place in hospitals and women receive postpartum care and well-baby care in health centers after being discharged from the hospital.

The data were collected through a validated questionnaire with the help of qualified nurses. The recruited nurses are Arab nationals who speak and write the English and Arabic languages well. They were aware of Arabic culture and thus were able to engage with and gain the trust of the study participants if the participants were not open to discussing their problems and answering the questions. Data collection took place from January 2010 to May 2011. The sample size was determined on an a priori presumption that the prevalence rate of postpartum depression in Qatar would be more or less similar to rates found in other countries in the eastern Mediterranean, where the reported prevalence of postpartum depression is 20%, with a 95% confidence interval for a 2.5% margin of error; a sample size of 2091 subjects was required for this study. Of the 22 primary health care centers available, we randomly selected ten. Of these, eight were located in urban and two in semiurban areas of Qatar. Finally, one out of every two subjects was selected systematically using a sampling procedure. Each participant was provided with brief information about the study and was assured of strict confidentiality. A total of 2091 Arab mothers were approached; 1659 mothers agreed to participate in the study, for a response rate of 79.3%. Qualified nurses were trained to interview the patients and complete the questionnaires. The survey instrument was initially tested for validation through face-to-face interviews with 100 patients who visited the health centers. The study excluded mothers whose postnatal period was longer than 6 months and who refused to give consent to take part in the study.

The questionnaire consisted of four parts. The first part collected the patients' sociodemographic details, the second part collected the patients' medical and family history,

the third part collected obstetric variables, and the fourth part was the diagnostic screening questionnaire. The DASS-21 questionnaire is a quantitative measure of distress on the basis of three subscales of depression, anxiety, and stress.<sup>9,10</sup> The DASS-21 is a brief, 21-item version of the full DASS, which originally consisted of 42 items. Each of the three DASS-21 scales contains seven items representing the dimensions of depression, anxiety, and stress. The DASS consists of three self-report scales that have been designed to measure the negative emotional scales of depression, anxiety, and stress. Each question has three subscales ranging from 0 to 3; the rating scale is as follows: (a) 0 for “did not apply to me at all,” (b) 1 for “applied to me to some degree, or some of the time,” (c) 2 for “applied to me to a considerable degree, or a good part of the time,” and (d) 3 for “applied to me very much, or most of the time.” Scores for the DASS-21 subscales of depression, anxiety, and stress were derived by totaling the scores for each subscale and multiplying by two. A score of DASS  $\geq$  10 was used to distinguish women suffering from depression, a score of DASS  $\geq$  8 for anxiety disorders, and a score of DASS  $\geq$  15 for stress.

The study was approved by the Institutional Review Board of the Hamad Medical Corporation’s Research Ethics Committee (HMC-MRC), as well as by the equivalent Weill Cornell Medical College body (WCMC-Q). Data were analyzed using SPSS software (version 19; SPSS Inc, Chicago, IL). Student’s *t*-tests were used to ascertain the significance of differences between mean values of two continuous variables. A chi-square analysis was performed to test for differences in proportions of categorical variables between two or more groups. A multivariate logistic regression analysis, using the forward inclusion and backward deletion method, was used to assess the relationship between dependent and independent variables and to adjust for potential confounders, and to order the importance of risk factors (determinants) for postpartum depression, anxiety, and stress. All statistical tests were two-sided and *P* < 0.05 was considered statistically significant.

## Results

Table 1 shows the sociodemographic characteristics of the studied postpartum women according to nationality. Of those studied, almost half were Qataris (45.9%), 40.3% were young women aged below 30 years old, 41.8% had a university degree, 53.6% were working women, and 47% had low monthly income (<QR10,000). There were statistically significant differences observed between both nationalities in terms of their sociodemographic characteristics, age groups

**Table 1** Sociodemographic characteristics of the postpartum women according to their nationality (N = 1659)

	Total N = 1659	Qatari (N = 762) n (%)	Other Arab (N = 897) n (%)	P <sup>§</sup> value
Age (mean $\pm$ SD)		31.8 $\pm$ 5.9	32.4 $\pm$ 6.5	0.05
Maternal age (years)				
<30	669 (40.3)	299 (39.2)	370 (41.2)	<0.001
30–34	430 (25.9)	209 (27.4)	221 (24.6)	
35–39	352 (21.2)	196 (25.7)	156 (17.4)	
40–45	208 (12.5)	58 (7.6)	150 (16.7)	
Education level				
Illiterate	110 (6.6)	44 (5.8)	66 (7.4)	<0.001
Primary	159 (9.6)	95 (12.5)	64 (7.1)	
Intermediate	202 (12.2)	65 (8.5)	137 (15.3)	
Secondary	495 (29.8)	259 (34)	236 (26.3)	
University	693 (41.8)	299 (39.2)	394 (43.9)	
Occupation				
Housewife	769 (46.4)	300 (39.4)	469 (52.3)	<0.001
Working	890 (53.6)	462 (60.6)	428 (47.7)	
Household income (QR)				
<10,000	779 (47.0)	322 (42.3)	457 (50.9)	0.002
10,000–20,000	707 (42.6)	354 (46.5)	353 (39.4)	
>20,000	173 (10.4)	86 (11.3)	87 (9.7)	
Parental consanguinity				
Yes	638 (38.5)	310 (40.7)	328 (36.6)	0.086
No	1021 (61.5)	452 (59.3)	569 (63.4)	
Baby’s sex				
Male	843 (50.8)	387 (50.8)	456 (50.8)	0.984
Female	816 (49.1)	375 (49.2)	441 (49.2)	
No of people living in the home (mean $\pm$ SD)				
6.2 $\pm$ 3.1	6.2 $\pm$ 3.1	6.0 $\pm$ 2.8	0.306	
No of people living in the home				
<5	502 (30.3)	225 (29.5)	277 (30.9)	0.543
$\geq$ 5	1157 (69.7)	537 (70.5)	620 (69.1)	

**Note:** <sup>§</sup>Two-sided *P*-value based on chi-square or the Student’s *t*-test.

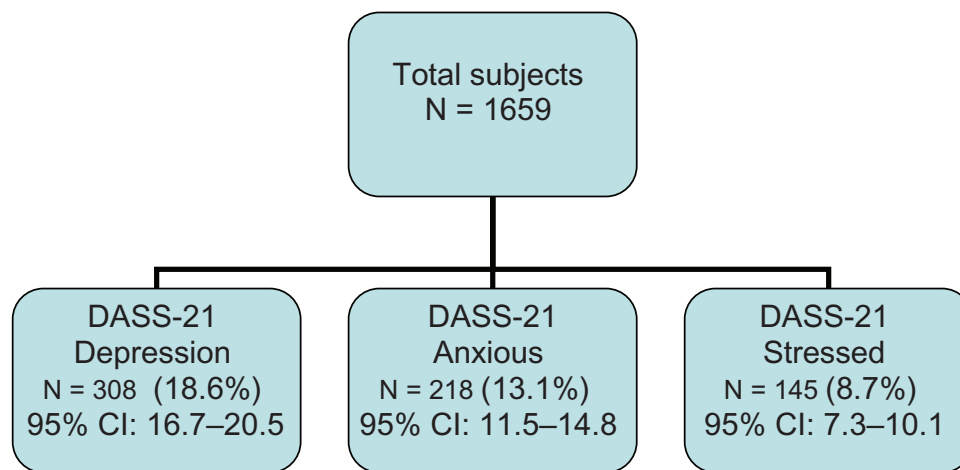
(*P* < 0.001), education levels (*P* = 0.003), occupations (*P* < 0.001), and monthly household income (*P* = 0.002).

Table 2 reveals the association of depression, anxiety, and stress with socio-demographic characteristics in postpartum women. Depression (18.6%) was more prevalent among postpartum women than anxiety (13.1%) and stress (8.7%). Figure 1 shows the prevalence of depression, anxiety, and stress using the DASS-21 instrument, along with their 95% confidence interval. Postpartum women aged under 30 years were mostly affected by depressive (35.7%) and anxiety (34.9%) disorders, while stress (29.7%) was more frequent among women aged 30 to 34 years. Depression (67.5%), anxiety (68.3%), and stress (62.1%) were more frequent among postpartum women with higher education (above secondary level). Working women were more under stress (60.7%), while housewives were more depressed (51.6%)

**Table 2** Association of depression, anxiety, and stress with sociodemographic characteristic in postpartum women (n = 1659)

Variables	Depression		P value	Anxiety		P value	Stress		P value
	Yes DASS ≥ 10 (n = 308) n (%)	No DASS < 10 (n = 1351) n (%)		Yes DASS ≥ 8 (n = 218) n (%)	No DASS < 8 (n = 1441) n (%)		Yes DASS ≥ 15 (n = 145) n (%)	No DASS < 15 (n = 1514) n (%)	
Age (mean ± SD)	32.6 ± 6.0	31.98 ± 6.2	0.114	32.5 ± 5.7	32.0 ± 6.3	0.348	33.6 ± 5.9	31.9 ± 6.2	0.002
Maternal age (years)									
<30	110 (35.7)	559 (41.4)	0.144	76 (34.9)	593 (41.2)	0.232	40 (27.6)	629 (41.5)	0.011
30–34	92 (29.9)	338 (25.0)		58 (26.6)	372 (25.8)		43 (29.7)	387 (25.6)	
35–39	62 (20.1)	290 (21.5)		56 (25.7)	296 (20.5)		38 (26.2)	314 (20.7)	
40–45	44 (14.3)	164 (12.1)		28 (12.8)	180 (12.5)		24 (16.6)	184 (12.2)	
Education level									
<Secondary level	100 (32.5)	373 (27.6)	0.088	69 (31.7)	404 (28.0)	0.270	55 (37.9)	418 (27.6)	0.009
≥Secondary level	208 (67.5)	978 (72.4)		149 (68.3)	1037 (72.0)		90 (62.1)	1096 (72.4)	
Occupation									
Housewife	159 (51.6)	610 (45.2)	0.040	105 (48.2)	664 (46.1)	0.565	57 (39.3)	712 (47.0)	0.075
Working	149 (48.4)	741 (54.8)		113 (51.8)	777 (53.9)		88 (60.7)	802 (53.0)	
Household income (QR)									
<10,000	129 (41.9)	650 (48.1)	0.082	112 (51.4)	667 (46.3)	0.161	69 (47.6)	710 (46.9)	0.668
10,000–20,000	139 (45.1)	568 (42.0)		80 (36.7)	627 (43.5)		64 (44.1)	643 (42.5)	
>20,000	40 (13.0)	133 (9.8)		26 (11.9)	147 (10.2)		12 (8.3)	161 (10.6)	
Sheesha smoker									
Yes	20 (6.5)	76 (5.6)	0.556	16 (7.3)	80 (5.6)	0.292	9 (6.2)	87 (5.7)	0.821
No	288 (93.5)	1275 (94.4)		202 (92.7)	1361 (94.4)		136 (93.8)	1427 (94.3)	
Parental consanguinity									
Yes	130 (42.2)	508 (37.6)	0.134	83 (38.1)	555 (38.5)	0.901	59 (40.7)	579 (38.2)	0.563
No	178 (57.8)	843 (62.4)		135 (61.9)	886 (61.5)		86 (59.3)	935 (61.8)	
Baby's sex									
Male	168 (54.5)	675 (50.0)	0.147	105 (48.2)	738 (51.2)	0.401	74 (51.0)	769 (50.8)	0.956
Female	140 (45.5)	676 (50.0)		113 (51.8)	703 (48.8)		71 (49.0)	745 (49.2)	
People living at home (mean ± SD)	6.0 ± 2.9	6.1 ± 3.0	0.810	5.9 ± 2.6	6.1 ± 3.1	0.581	6.2 ± 2.9	6.1 ± 3.0	0.747

**Abbreviation:** DASS-21, 21-item Depression Anxiety Stress Scale.



**Figure 1** Classification of postpartum women on the DASS-21 questionnaire: prevalence and their 95% CI.  
**Abbreviations:** CI, confidence interval; DASS-21, Depression Anxiety Stress Scales.

and anxious (48.2%) in their postpartum period. A significant difference was observed between depressed and nondepressed women in their occupation ( $P = 0.040$ ). No significant difference was found in the sociodemographic characteristics of postpartum women with and without anxiety, while there was significant association in their age ( $P = 0.01$ ) and educational level ( $P = 0.009$ ) with stress.

Table 3 examines the association of depression, anxiety, and stress with stressful life events in postpartum women. Nearly half of the depressed mothers reported experiencing more than one stressful life event in their postpartum period, such as low income (41.9%;  $P = 0.05$ ) or unplanned pregnancy (60.4%;  $P < 0.001$ ). Nearly a quarter of mothers with depression and anxiety had less family support (21.8% and 25.2%, respectively) and difficulty managing with their monthly income (23.1% and 29.4%, respectively). Three-quarters of mothers with depression (78.2%), anxiety (78.9%), and stress (75.2%) experienced poor relationships with their mothers-in-law. There was a significant association between mothers with/without depression and anxiety in their stressful life events, such as strong family support, poor marital relationships, and unplanned pregnancy ( $P < 0.05$ ). Postpartum mothers under stress had significant associations with their counterparts in poor marital relationships and pregnancy complications ( $P < 0.05$ ). Furthermore, the Venn diagram (Figure 2) reveals the overlap of postpartum depression, anxiety, and stress among mothers.

Table 4 shows the postpartum depression correlates of anxiety and stress using a multivariate analysis. Unplanned pregnancy (odds ratio [OR] = 1.9;  $P < 0.001$ ), a lack of family support (OR = 1.6;  $P = 0.005$ ), and housewives

(OR = 1.6;  $P = 0.001$ ) were the most significant correlates for postpartum depression, while a lack of family support (OR = 1.9;  $P < 0.001$ ) and dissatisfaction in married life (OR = 1.6;  $P = 0.02$ ) were the significant correlates for postpartum anxiety. Delivery by cesarean section was a significant factor of postpartum depression (OR = 1.4;  $P = 0.004$ ) and anxiety (OR = 1.5;  $P = 0.012$ ). For stress, being an older mother (40 to 45 years old; OR = 2.0,  $P = 0.04$ ) and dissatisfaction in married life (OR = 1.9;  $P = 0.006$ ) were the significant correlates. Furthermore, the Venn diagram in Figure 2 reveals the overlap of postpartum depression, anxiety, and stress among mothers.

Table 5 compares the global prevalence rates of postpartum depression.

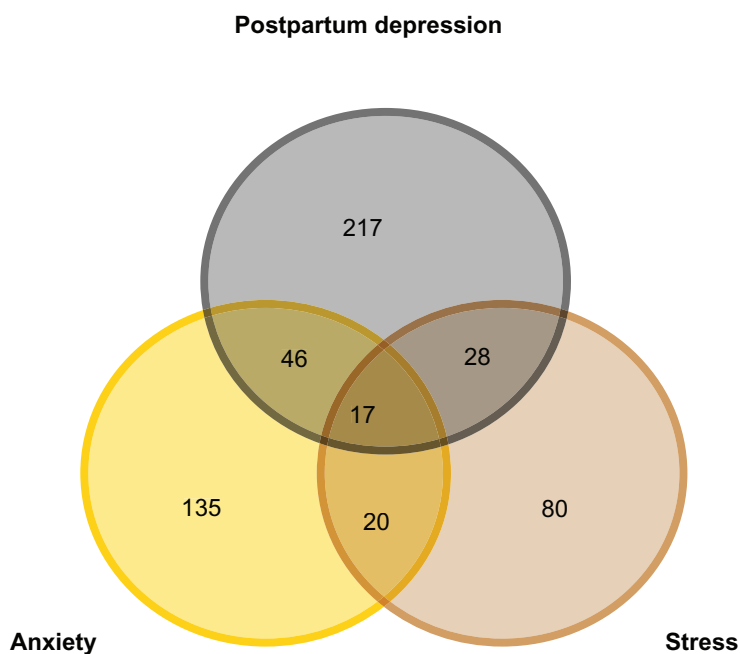
## Discussion

Having a child is a time of biological, psychological, and social change in a woman's life. These changes can contribute to personal growth and happiness, but may also predispose women to emotional distress. In the present study, the DASS-21 instrument was used to assess the comorbidity of the three negative emotional states of depression, anxiety, and stress as separate phenomena in postpartum women. The study identified a higher prevalence of depression (18.6%) in Arab women during their postpartum period compared to the prevalence of anxiety (13.1%) and stress (8.7%). A study by Matthey et al<sup>11</sup> showed a similar psychological morbidity, with 17% experiencing depression and 13% experiencing anxiety. Also, a recent population-based survey of Australian women<sup>3</sup> reported rates of 12.7% for anxiety and 17.4% for depression. These study results consistently suggest that more than 10% of mothers suffer

**Table 3** Association of depression, anxiety and stress with stressful life events in postpartum women (n = 1659)

	<b>Depressed DASS ≥ 10 (n = 308) n (%)</b>	<b>P<sup>§</sup> value</b>	<b>Anxiety DASS ≥ 8 (n = 218) n (%)</b>	<b>P<sup>§</sup> value</b>	<b>Stress DASS ≥ 15 (n = 145) n (%)</b>	<b>P<sup>§</sup> value</b>
<b>Relationship stressors</b>						
Relations with mother-in-law						
Good	67 (21.8)	0.521	46 (21.1)	0.442	36 (24.8)	0.615
Bad	241 (78.2)		172 (78.9)		109 (75.2)	
Strong family support						
Yes	241 (78.2)	0.001	163 (74.8)	<0.001	122 (84.1)	0.880
No	67 (21.8)		55 (25.2)		23 (15.9)	
Satisfaction with marital life						
Yes	258 (83.8)	0.004	177 (81.2)	<0.001	118 (81.4)	0.005
No	50 (16.2)		41 (18.8)		27 (18.6)	
<b>Financial stressors</b>						
Difficult to manage within income						
Yes	237 (76.9)	0.505	154 (70.6)	0.003	110 (75.9)	0.259
No	71 (23.1)		64 (29.4)		35 (24.1)	
Low income						
Yes	129 (41.9)	0.048	112 (51.4)	0.161	69 (47.6)	0.874
No	179 (58.1)		106 (48.6)		76 (52.4)	
<b>Maternal stressors</b>						
Planned pregnancy						
Yes	122 (39.6)	<0.001	98 (45.0)	0.006	78 (53.8)	0.958
No	186 (60.4)		120 (55.0)		67 (46.2)	
Pregnancy complications						
Yes	100 (32.5)	0.887	75 (34.4)	0.440	61 (42.1)	0.007
No	208 (67.5)		143 (65.6)		84 (57.9)	
Parity						
Primiparous	35 (11.4)	0.807	28 (12.8)	0.342	16 (11.0)	0.979
Multiparous	273 (88.6)		190 (87.2)		129 (89.0)	

**Notes:** DASS-21 = 21-item Depression, Anxiety, Stress Scale; <sup>§</sup>comparison between depressed vs nondepressed, anxious vs nonanxious, stressed vs nonstressed.

**Figure 2** Venn diagram showing the overlapping of postpartum depression, anxiety, and stress among mothers in Qatar (N = 1659).

**Notes:** Postpartum depression, 308; anxiety, 218; stress, 145.



**Table 4** Correlates of postpartum depression, anxiety, and stress in Qatar using multivariate analysis (n = 1659)

	Adj. OR (95% CI)	P value
<b>Depression</b>		
Education level		
≥Secondary	1 ref	0.006
<Secondary	1.5 (1.1–2.0)	
Occupation		
Working	1 ref	0.001
Housewife	1.6 (1.2–2.1)	
Family support		
Yes	1 ref	0.005
No	1.6 (1.2–2.3)	
Nature of pregnancy		
Planned	1 ref	<0.001
Unplanned	1.9 (1.5–2.6)	
Type of delivery		
Vaginal	1 ref	0.004
C-section	1.4 (1.1–1.9)	
<b>Anxiety</b>		
Family support		
Yes	1 ref	<0.001
No	1.9 (1.3–2.8)	
Nature of pregnancy		
Planned	1 ref	0.035
Unplanned	1.4 (1.1–1.8)	
Type of delivery		
Vaginal	1 ref	0.012
C-section	1.5 (1.1–2.0)	
Marital satisfaction		
Yes	1 ref	0.018
No	1.6 (1.1–2.5)	
<b>Stress</b>		
Age		
<30	1 ref	0.043
30–34	1.5 (1.1–2.5)	
35–39	1.6 (1.1–2.6)	
40–45	2.0 (1.2–3.5)	
Education level		
≥Secondary	1 ref	0.043
<Secondary	1.5 (1.1–2.2)	
Marital satisfaction		
Yes	1 ref	0.006
No	1.9 (1.2–3.1)	

**Note:** Adjusted OR are adjusted for all the variables present in the table.

**Abbreviation:** Ref, reference category.

from depression, anxiety, and stress in the early postpartum period. A lower prevalence was observed in a study<sup>12</sup> using the DASS-21, which found that 7% of women had symptoms of anxiety and depression during their postpartum period. It is widely acknowledged<sup>8</sup> that the 21 DASS items measure the severity of symptoms common to anxiety and depression in postpartum women.

Depression is a mood disorder that manifests itself in various ways. According to Beck et al,<sup>13</sup> depression can negatively

influence a person's motivation and affect their cognition and physiology. The prevalence of postpartum depression in the present study is higher than those reported in countries such as England,<sup>14</sup> Japan,<sup>15</sup> and Hong Kong,<sup>16</sup> but similar to rates reported in other Arab countries such as Morocco,<sup>17</sup> Lebanon,<sup>18</sup> and the UAE.<sup>19</sup> Postpartum depression is an important public health problem that has negative effects on the mother, the infant, and the whole family. Affonso et al<sup>20</sup> found that postpartum depressive symptoms were lowest among European and Australian women, and highest among mothers from non-Western countries like Taiwan and India. This shows a higher prevalence of postpartum depression and anxiety in women from Asian countries compared to non-Western populations. The higher prevalence of psychological distress in Asian women might be due to cultural differences, such as relationships with in-laws and the influence of extended family members.

In the studied postpartum women, women who reported more depressive disorders were more likely to be under 30 years old (35.7%), housewives (51.6%), women who have at least completed their secondary education or higher (67.5%), or have low income (<QR10,000) (41.9%). A similar pattern was observed in women who reported anxiety disorders, except for occupation; women aged under 30 years reported in at 34.9%, women who completed their secondary education and above reported in at 68.3%, and low income women reported in at 51.4%, whereas stress was more frequent among women in the 30- to 34-year-old age group (29.7%). Anxiety (51.8%) and stress (60.7%) disorders were observed more among working women in their postpartum period. Further studies<sup>11,21</sup> have identified sociodemographic associations with postpartum depression, anxiety, and stress disorders.

The study analysis revealed that the studied postpartum women experienced a range of stressful life events, such as relationship, financial, and maternal stressors. It was reported by Baker et al<sup>22</sup> that a history of marital discord, a poor parenting relationship experienced during childhood, low self-esteem, low socioeconomic status, unwanted pregnancy, and stressful life events during pregnancy have been associated with postpartum mental disorders. More than three-quarters of postpartum mothers with depression (78.2%), anxiety (78.9%), and stress (75.2%) reported poor relationships with their mothers-in-law. Nearly half of the postpartum mothers with depression and anxiety reported experiencing more than one stressful life event, such as low income (58.1% and 48.6%, respectively) and unplanned pregnancy (60.4% and 55%, respectively), with a significant

**Table 5** Prevalence rate for postpartum depression according to ethnicity: global comparison

Country	Age group	Sample size	Prevalence rate (%)	Year	Reference
Australia	16–35 years	4366	17.4%	2010	Yelland et al <sup>3</sup>
Australia	18–44 years	80	24.7%	2006	Miller et al <sup>12</sup>
Australia	17–36 years	52	25.1%	2007	Phillips et al <sup>24</sup>
Brazil	14–47 years	271	20.7%	2008	Tannous et al <sup>25</sup>
Brazil	13–31 years	410	19.0%	2000	Moraes et al <sup>26</sup>
Goa, India	18–37 years	59	23%	2001	Patel et al <sup>27</sup>
Pakistan	17–40 years	149	36%	2006	Husain et al <sup>19</sup>
Morocco	18–44 years	144	18.7%	2005	Agoub et al <sup>28</sup>
Oklahoma	18–35 years	5586	26%	2000–2006	Lincoln et al <sup>29</sup>
Turkey	15–44 years	1447	29.0% at 0–2 months 36.6% at 3–6 months 36.0% at 7–12 months 42.7% at >13 months	2004	Bugdayci et al <sup>30</sup>
Dubai	25–34 years	90	18.0%	1997	Abou Saleh and Ghubash <sup>31</sup>
Bangladesh	17–41 years	361	33%	2009	Gausia et al <sup>32</sup>
USA	17–47 years	192	23.4%	1995	Hobfoll et al <sup>33</sup>
Qatar (current study)	18–45 years	1659	18.6%	2010–2011	Bener et al

association with their counterparts. The major significant correlates of depression were unplanned pregnancy, lack of family support, and mothers as housewives, whereas for anxiety disorders, lack of family support and dissatisfaction in married life were the significant correlates. Older mothers (40 to 45 years old) and marital dissatisfaction were the major significant correlates for stress disorders. These study results reveal that the depression, anxiety and stress, the quality of relationships with husbands, and family support are all significantly intercorrelated. There was a nearly two-fold increase in the odds of reporting depression, anxiety, and stress in women experiencing one to two stressful life events, confirming the marked association between stressful life events and emotional distress in their postpartum period. The most common life events that affected our postpartum mothers were unplanned pregnancy and poor relationships with their mothers-in-law. International studies<sup>2,23</sup> have also identified similar associations between stressful life events and psychological ill health.

The current study results make us believe that the provision of adequate postpartum care is crucial in the identification of emotional distress. Considering the high prevalence of psychological morbidity during the postpartum period of mothers and their association with social health issues, health care personnel need to be alert to a wide range of social health issues. The present study recommends education programs for health care professionals to increase their awareness of postpartum mental illness. Health care providers should provide women with opportunities and encouragement to talk

in-depth about their feelings, including stressful life events. Antenatal screening programs can identify women who are at risk of mental disorders.

The limitations of the study need to be noted. The study did not assess the prevalence of stress, anxiety, and depression in the studied women during their antenatal period. Also, information like paternal stress, previous psychiatric history, and family histories of psychiatric illnesses were not included in the questionnaire. Approximately 20% of the approached mothers declined to participate, and these women may have had a higher frequency of risk factors.

## Conclusion

In general, our study findings are consistent with the results observed in the literature. Young mothers presented higher levels of postnatal distress, including depression, anxiety, and stress. Sociodemographic factors such as younger ages, higher education levels, and lower household income were associated with depression, anxiety, and stress disorders. Working women were more affected by anxiety and stress disorders, whereas most of the depressed mothers were housewives. Similarly, stressful life events were associated with the development of probable postpartum depression, anxiety, and stress disorders. Identifying correlates of postnatal distress can lead to more detailed investigation to identify contributory factors for such distress. Finally, preventive strategies designed to attenuate or eliminate the impact of such contributory factors can substantially improve the emotional well-being of women in the vulnerable postnatal period.



## Author contributions

AB contributed to the research idea design of this study, and to the collection and analysis of the data and the preparation of the manuscript. LMG and JS contributed to the design and preparation of the manuscript. All authors have read and approved the final version of the manuscript.

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## Disclosure

The authors declare that they have no competing interests in this work.

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