

Prevalence and Risk Factors of Postpartum Depressive Symptoms among Women from Al-Anbar Governorate, Iraq

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ABSTRACT

Background: Postpartum depression (PPD) is a major health issue of concern to the population, and the occurrence of this condition among mothers is almost one in every five across the globe. This situation may impair women's capacity to care for herself and her baby.

Objectives: To determine the prevalence of PPD and the risk factors that are related to the prevalence in women in Al Anbar Governorate, Iraq.

Materials and methods: A total of 618 mothers eight weeks postpartum were recruited into a cross-sectional study that will be carried out at 23 primary health centers between February 2024 and February 2025. Structured interviews based on sociodemographic, obstetric, and psychosocial variables were used to collect the data with the help of the Edinburgh Postnatal Depression Scale.

Results: With a cut off of 11 or more, depressive symptoms were found in 42.4% of mothers. Notable predictors were ≥ 4 weeks postpartum (OR = 1.99, CI: 1.38–2.87, P-value < 0.001), adverse life events (OR = 1.80, CI: 1.22–2.64, P-value = 0.003), prenatal depressive symptoms (OR = 2.21, CI: 1.55–3.14, P-value = 0.001), lack of social support (OR = 2.49, CI: 1.62–3.83, P-value < 0.001), and irregular antenatal care (OR = 2.71, CI: 1.81–4.06, P-value < 0.001).

Conclusion: The problem of PPD was extremely common among women in Al Anbar. This observation underscores the necessity to enhance maternal health provision, such as psychosocial support and improved education in the primary care environment.

Keywords: Postpartum depression; Prevalence; Risk factors; Maternal mental health; Iraqi women health.

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INTRODUCTION

Postpartum depression (PPD) is a prevalent and usually disabling mental disorder. It is estimated that 7-13 percent of mothers in high income countries develop PPD and in low- and middle-income countries the rates often go above 20 percent. Some of the symptoms of the condition include persistent sadness, fatigue, loss of interest, irritation, and self-harm. These symptoms may seriously interfere with the capability of a mother to take care of herself and the newborn [1]. Even though transient mood changes, also known as baby blues, are normal in the

postpartum period, PPD is worse and long-lasting, and this necessitates medical or psychological treatment [2].

PPD is often incorrectly diagnosed in resource constrained environments. Mental health cultural stigma, especially in conservative societies, makes women uninterested in getting help. The lack of services may also add to the issue [3]. Prenatal and postnatal visits have been found to decrease risk through early screening that links women with the timely help [4]. It has also been established that extensive prenatal care, which considers both physical and psychological needs, is linked with the reduction of PPD rates [5]. Mental health screenings allow early intervention in well-resourced environments. Even the slightest intervention, such as counseling or support groups, can greatly decrease PPD risk [6]. In developing countries, however, prenatal care is focused on physical health, and no attention is paid to psychological needs. The

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risk of PPD can be significantly elevated by this approach [7].

Some studies have found an increasing prevalence of PPD in the Middle East, attributed to perpetual conflict, poverty, and a lack of mental health facilities [8–10]. In Iraq, there is limited national information. Nevertheless, the percentage of PPD ranges between 7 and 51% depending on the regions, which depicts the sociocultural and economic strains [11–14]. It is of utmost importance that the stigma of reporting the psychological symptoms of PPD in conservative cultures, such as that of the Iraqi society, is also a significant factor that worsens the situation, leaving most women without any support. The largest governorate west of Iraq, in this case Al Anbar, has been experiencing a long period of instability and has been severely disrupted in terms of healthcare delivery. The trauma of wars and poor social networks has also contributed to vulnerability among mothers [15]. This study is thus aimed at finding out the rate of PPD in Al Anbar and to investigate sociodemographic, reproductive, obstetric, and psychological determinants related to PPD.

MATERIALS AND METHODS

Study Design

This study was done in the form of a cross-sectional prospective study in 23 primary health care centers (PHCs) in Al Anbar Governorate, Iraq. Simple random sampling was used to select the centers, which represented the area of about three quarters of the PHCs. Table 1 explains the PHCs and their locations. The data collection was conducted during the 12 months (between March 2024; and February 2025).

Participants

The possible participants were mothers within 8 weeks of the postpartum period who visited the maternal clinics in the chosen PHCs. The recruitment was conducted on a convenient basis. Women were out of the study when or their husband refused to participate, the interviews were not completed, and the responses were inconsistent. Informed consent was obtained from each participant, and interviews were conducted.

Calculation of the required sample size

Calculation of the required sample size was based on a prevalence estimate of 20 percent of postpartum depression

Table 1. Primary health centers (PHCs) were involved in the study, and their locations.

Name of PHC	Location of PHC
First Ramadi	Ramadi city
Second Ramadi	Ramadi city
Al Falluja	Al Falluja city
Al Khaldia	Al Khaldia city
Haditha	Haditha city
Heet	Heet city
Al Karma	Al Karma city
Aana	Aana city
Al Rutba	Al Rutba city
Al Baghdadi	Al Baghdadi city
Al Qaim	Al Qaim city
Al Faris	Al Amriya city

[16], 95 percent confidence, and a 3 percent margin of error. The formula applied was:

$$n = \frac{Z^2 p(1 - p)}{E^2}$$

Where Z = 1.96 (95% confidence), p (estimated prevalence) = 0.20, and E (margin of error) = 0.03.

The sample size was calculated to be 683. The sample size of 618 mothers (90.5 percent of the target) was obtained after eliminating 65 participants because of missing data.

Data Collection

The interviews were conducted in the privacy of the clinic to ensure confidentiality. The sessions took about 30-40 minutes. The questionnaire applied had two parts. The initial section contained 30 items that addressed sociodemographic, obstetric, and psychosocial factors, including maternal age, postpartum weeks, residence, occupation, education, income, pregnancy planning, type of delivery, and exposure to adverse events or domestic violence [8, 9, 11–14].

The latter section used the Edinburgh Postnatal Depression Scale (EPDS), which is an instrument that is validated and is used extensively to measure depressive symptoms in the postpartum phase [17, 18]. The items were rated on a four-point scale, with maximum scores were 0-30. A cut-off ≥ 11 was used to suggest the likely depressive symptoms [9]. To make sure that there was consistency, the tool was pilot tested on ten mothers who attended Al Ta’amim PHC in Al Ramadi city, which was not part of the study centers.

Statistical analysis

Data coding and tabulation were performed in Microsoft Excel version 2010, and the data were analyzed using the IBM SPSS (Statistical Package for the Social Sciences) version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented in means, frequencies, percentages and standard deviations, and the Chi-square test was used to assess the associations between categorical variables with the significance level fixed at P-value < 0.05.

RESULTS

A total of 262 (42.4%) women scored ≥ 11 on EPDS, which showed that they were likely to have PPD (Figure 1).

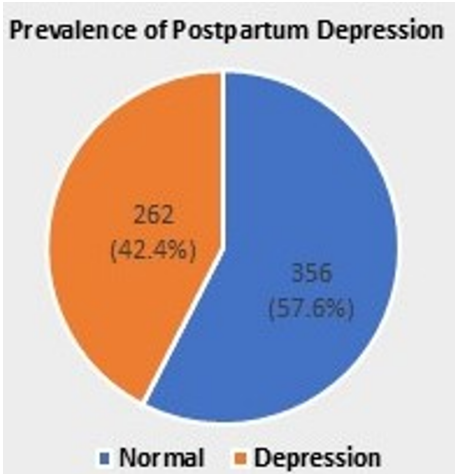


Figure 1. Prevalence of postpartum depression (cutoff point ≥ 11) among respondents (n=618).

Table 2. Associations of postpartum depression (PPD) and sociodemographic factors (n=618).

Variable	Category	PPD-Yes 262(42.4%)	PPD-No 356(57.6%)	Chi-Square	P-value
Age group of mothers	<20	39 (42.9%)	52 (57.1%)	10.800	0.013
	20–29	136 (42.1%)	187 (57.9%)		
	30–39	66 (37.9%)	108 (62.1%)		
	≥40	21 (70.0%)	9 (30.0%)		
History of abortion	Yes	41 (47.7%)	45 (52.3%)	1.140	0.286
	No	221 (41.5%)	311 (58.5%)		
Antenatal care visits	Irregular	140 (51.9%)	130 (48.1%)	12.892	0.0001
	Regular	122 (35.1%)	226 (64.9%)		
Age group of husbands	<30	112 (41.5%)	158 (58.5%)	3.242	0.198
	30–49	150 (43.6%)	194 (56.4%)		
	≥50	0 (0.0%)	4 (100.0%)		
Postpartum weeks	<4 weeks	182 (46.4%)	210 (53.6%)	7.142	0.008
	≥4 weeks	80 (35.4%)	146 (64.6%)		
Place of residency	Central	166 (42.0%)	229 (58.0%)	0.058	0.810
	Peripheral	96 (43.0%)	127 (57.0%)		
Occupation of mother	Housewife	179 (39.9%)	270 (60.1%)	4.298	0.038
	Employee	83 (49.1%)	86 (50.9%)		
Occupation of husband	Unemployed	107 (39.8%)	162 (60.2%)	1.157	0.282
	Employed	153 (44.1%)	194 (55.9%)		
Mother's education	Illiterate	35 (59.3%)	24 (40.7%)	10.370	0.035
	Primary	85 (38.6%)	135 (61.4%)		
	Secondary	69 (41.6%)	97 (58.4%)		
	Graduated	53 (46.1%)	62 (53.9%)		
	Postgraduate	20 (34.5%)	38 (65.5%)		
Father's education	Illiterate	28 (46.7%)	32 (53.3%)	21.458	0.0001
	Primary	73 (44.8%)	90 (55.2%)		
	Secondary	69 (37.3%)	116 (62.7%)		
	Graduated	77 (53.8%)	66 (46.2%)		
	Postgraduate	15 (22.4%)	52 (77.6%)		
Economic status	Enough	172 (39.0%)	269 (61.0%)	7.257	0.007
	Not enough	90 (50.8%)	87 (49.2%)		
Living with husband	Yes	173 (44.5%)	216 (55.5%)	1.857	0.173
	No	89 (38.9%)	140 (61.1%)		
Number of children	0	0 (0.0%)	6 (100.0%)	8.415	0.038
	1–2	135 (39.6%)	206 (60.4%)		
	3–4	85 (45.2%)	103 (54.8%)		
	>4	42 (50.6%)	41 (49.4%)		

Socio-demographic characteristics

Most of the respondents (52.3%) were aged between 20 and 29 years. Most husbands (55.7%) fell within the age bracket of 30–49 years. Two-thirds of mothers (63.4%) were surveyed 4 weeks after childbirth, and 63.9% were urban based. There were employment patterns; that 72.7% of mothers were housewives, and 77.7% of husbands were employed. On the financial aspect, 71.4% of families had enough income. Mothers had different levels of education, with 35.6% having primary education. Mothers aged ≥ 40 years had the highest prevalence of PPD (70%, P-value = 0.013). Irregular antenatal care visits were strongly linked to higher depression rates (P-value = 0.0001). Employment status also mattered: employed mothers reported more PPD than housewives (P-value = 0.038). Educational attainment showed a protective effect, with illiterate mothers experiencing the highest rates (59.3%) and postgraduates the lowest (34.5%, P-value = 0.035). Husband's education was even more strongly associated (P-value

= 0.0001). Poor economic status was also a significant predictor (P-value = 0.007). Other variables showed no significant associations (Table 2).

Reproductive and obstetric factors

Most participants had one to two children (55.2%). The sex ratio of infants was nearly balanced. Planned pregnancies accounted for 66.0% of cases, and vaginal delivery was more common (61.2%) than cesarean section (38.8%). A family history of depression was reported by 38% of mothers. Significant associations were found between PPD and unplanned pregnancies (P-value = 0.040), family history of depression (P-value = 0.0001), unwanted pregnancies (P-value = 0.020), and child health status (P-value = 0.031), as shown in Table 3.

Psychological and social factors

Adverse life events were reported by 28.8% of mothers, and domestic violence by 19.6%. Both were strongly associated

Table 3. Associations of postpartum depression (PPD) with reproductive and obstetric factors (n=618).

Variable	Category	PPD-Yes 262(42.4%)	PPD-No 356(57.6%)	Chi-Square	P-value
Sex of child	Male	121 (41.2%)	173 (58.8%)	0.352	0.553
	Female	141 (43.5%)	183 (56.5%)		
Age of marriage	<18 years	58 (46.8%)	66 (53.2%)	1.218	0.270
	≥18 years	204 (41.3%)	290 (58.7%)		
Planning of last pregnancy	Planned	161 (39.5%)	247 (60.5%)	4.232	0.040
	Unplanned	101 (48.1%)	109 (51.9%)		
Type of labor	Normal vaginal delivery	156 (41.3%)	222 (58.7%)	0.504	0.478
	Caesarean section	106 (44.2%)	134 (55.8%)		
Family history of depressive symptoms	Yes	133 (54.5%)	111 (45.5%)	24.225	0.0001
	No	129 (34.5%)	245 (65.5%)		
History of unwanted last pregnancy	Yes	92 (49.5%)	94 (50.5%)	5.442	0.020
	No	170 (39.4%)	262 (60.6%)		
History of gestational diabetes	Yes	38 (41.8%)	53 (58.2%)	0.018	0.894
	No	224 (42.5%)	303 (57.5%)		
History of preeclampsia	Yes	64 (49.6%)	65 (50.4%)	3.478	0.062
	No	198 (40.5%)	291 (59.5%)		
History of abortion	Yes	41 (47.7%)	45 (52.3%)	1.140	0.286
	No	221 (41.5%)	311 (58.5%)		
History of complicated labor	Yes	94 (45.2%)	114 (54.8%)	1.005	0.316
	No	168 (41.0%)	242 (59.0%)		
Postnatal complication	Yes	59 (44.7%)	73 (55.3%)	0.364	0.546
	No	203 (41.8%)	283 (58.2%)		
Child health	Alive and normal	203 (45.1%)	247 (54.9%)	6.941	0.031
	Alive but sick	56 (36.8%)	96 (63.2%)		
	Dead	3 (18.8%)	13 (81.2%)		

Table 4. Associations of postpartum depression (PPD) with psychological factors (n=618). PHC = Primary health care centers.

Variable	Category	PPD-Yes 262(42.4%)	PPD-No 356(57.6%)	Chi-Square	P-value
Adverse life events	Yes	100 (56.2%)	78 (43.8%)	19.453	0.0001
	No	162 (36.8%)	278 (63.2%)		
Living with husband support	Yes	221 (43.0%)	293 (57.0%)	0.452	0.501
	No	41 (39.4%)	63 (60.6%)		
History of domestic violence	Yes	70 (57.9%)	51 (42.1%)	14.718	0.0001
	No	192 (38.6%)	305 (61.4%)		
Last pregnancy	First pregnancy	74 (42.8%)	99 (57.2%)	0.014	0.905
	Previous pregnancy	188 (42.2%)	257 (57.8%)		
Social care and education by PHC	Yes	191 (45.4%)	230 (54.6%)	4.781	0.029
	No	71 (36.0%)	126 (64.0%)		
Family support (around birth)	Yes	184 (39.7%)	279 (60.3%)	5.324	0.021
	No	78 (50.3%)	77 (49.7%)		

with higher PPD prevalence (P-value = 0.0001). Lack of family support increased risk (P-value = 0.021), while receiving social care and education at PHCs was protective (P-value = 0.029). Husband support and parity showed no significant associations (Table 4).

Multivariate analysis

Table 5 shows binary logistic regression results. Women ≥ 4 weeks postpartum (OR = 1.99), experiencing adverse life events (OR = 1.80), prior depressive symptoms (OR = 2.21),

lack of PHC social support (OR = 2.49), and irregular ANC visits (OR = 2.71) had significantly higher PPD risk (all P-value < 0.01).

DISCUSSION

PPD is among the most prevalent perinatal mental health disorders and carries significant consequences for maternal wellbeing, infant development, and family functioning. Its burden is particularly pronounced in conflict-affected, low-resource settings where psychosocial risks are amplified, and

Table 5. Multiple logistic regression analysis to predict postpartum depression (n=618). PHC = Primary health care centers*.

Predictor	Categories	B	S.E.	Wald	Sig.	Exp(B)	95% C.I. for Exp(B)
Postpartum period	4 weeks and more <4 weeks	0.688 Reference	0.186	13.696	0.000	1.990	1.382–2.865
Adverse life events	Yes No	0.586 Reference	0.196	8.929	0.003	1.796	1.223–2.638
Depression symptoms in last pregnancy	Yes No	0.791 Reference	0.180	19.392	0.000	2.205	1.551–3.135
Social care and social education by PHC	No Yes	0.913 Reference	0.219	17.378	0.000	2.492	1.622–3.829
Regular antenatal care visits	Irregular Regular	0.996 Reference	0.207	23.245	0.000	2.707	1.806–4.057
Constant*	–	-3.307	0.441	56.243	0.000	0.037	–

* It represents log-odds when all predictors are at reference levels and are not interpreted as a predictor.

mental health services remain limited. In this study, 42.4% of mothers in Al Anbar Governorate showed postpartum depressive symptoms, suggesting potential PPD. This proportion is in line with previously reported PPD rates from conflict-affected regions in Iraq [8, 15, 19]. Comparable results were found by Al-Imam and colleagues, who reported a PPD prevalence of about 51.49% among a sample of Iraqi mothers [10]. Also, studies in the densely populated city of Mosul in the north of Iraq revealed that PPD was between 10 and 37 percent with an increase of the rate in displaced populations [8, 9]. Also, Seidi et al. reported the presence of perinatal depressive symptoms in 53.3% of internally displaced women in Sulaymaniyah [19]. It should be mentioned that Sulaymaniyah is relatively stable compared to other cities in Iraq, with little violent conflict, making it a safe place for displaced people from other parts of the country that were worse hit, including Al Anbar and Mosul. The findings of our study, along with the findings of Mosul and Sulaymaniyah, highlight the long-term psychological effects of conflict [9]. However, the prevalence of the PPD in our study is higher than the 24.7% prevalence of the PPD in a systematic review of the low- and middle-income countries conducted by Mitchell et al. [16]. The reason for this difference could be the additional psychological burden placed on the populations in the low- and middle-income environments caused by conflict.

The bivariate analysis indicated that there were some important factors that were related to PPD. Maternal age ≥ 40 years was the most significant sociodemographic predictor of an increased PPD prevalence, as Deepu and Rupa (2024) found in Qatar, where older mothers (40–44 years) were at a higher risk because of physiological and social stressors [20].

Parental education was also positively associated with reduced PPD rates, and it might prevent it by increasing health literacy, which was also observed in a 2024 study in Jordan [21]. The low economic status contributed greatly to PPD, which is consistent with the results of Zedan et al. in Saudi Arabia, where financial strain was one of the key factors [22].

On reproductive and obstetric factors, unintended pregnancy was a risk factor of PPD, which confirms Qiu et al. 2020 meta-analysis [23]. PPD was closely related to a family history of depression [24]. Psychosocial stress, family violence, and poor family support in the birth process were also risk factors associated with PPD, which was demonstrated by

Mannathoko et al. [25] and Alshahrani et al. [26].

Multivariate analysis showed that there are strong predictors of PPD, such as postpartum period, negative life events, pre-partum depressive symptoms, absence of social care or education in PHC centers and non-regular ANC visits. Women evaluated ≥ 4 weeks after delivery were almost twice as likely (OR 1.990) to develop PPD as opposed to those in the initial four weeks, which is in line with Hsu et al. [27]. Recent stressful experiences were also a significant risk factor of PPD, which fits in a 2024 Jordanian study of family conflict, financial stress, and displacement as predictors of greater vulnerability [11]. Past depressive symptoms also proved to be good predictors, as validated by Agrawal (2022) [28]. In addition, poor social support or antenatal education [29] and inconsistent ANC attendance [30] significantly increased the risk of PPD.

The prevalence of PPD was high in our study, but comparisons between studies ought to consider differences in the cutoffs of EPDS, postpartum timing, and the study's populations.

Implications

Iraq requires better screening, frequent ANC, PHC-based care, education, and specialized care for mothers after four weeks of childbirth, considering the high prevalence of PPD and its associations with obstetric and psychosocial factors.

The generalizability of our findings may be limited by the relatively small sample size. This was mainly due to difficulties in reaching remote areas such as Al-Rutba and Al-Qa'im, as well as to some women reluctance of some women to participate because of the lengthy interview process. In addition, social stigma may have contributed to the underreporting of symptoms. The cross-sectional design of the study represents another limitation, as it does not allow for causal inference. Therefore, future studies should adopt a longitudinal design, incorporate diagnostic interviews, and evaluate the effectiveness of relevant interventions.

CONCLUSION

This study demonstrates that PPD is a common maternal health problem in Al-Anbar Governorate, affecting 42.4% of recently delivered women. Significant predictors included the later postpartum period, adverse life events, and depressive

symptoms during a previous pregnancy. Poor social support, lack of maternal health education at primary health care centers, and irregular ANC were associated with increased risk. These findings underscore the need for routine screening for depressive symptoms within maternal and child health services, along with strengthened ANC, targeted health education, and sustained psychosocial support to improve maternal and child health outcomes.

ETHICAL DECLARATIONS

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Ethics Approval and Consent to Participate

Ethical approval (Reference number: 77 dated 5-8-2024) was granted from the institutional review board of the College of Medicine, Al-Nahrain University. Every method followed the ethical criteria of the institutional research committee and the 1964 Helsinki Declaration and its revisions. Before being added to the study, each participant provided informed consent.

Consent for Publication

Not applicable (No personal information was published).

Availability of Data and Material

Data generated during this study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that there is no conflict of interest.

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Use of Artificial Intelligence

Artificial intelligence has been used in limited ways to correct spelling, grammar, and punctuation, as well as in specific texts with editing.

Authors' Contributions

Hussain NA handled the conceptualization and methodology of the study, performed statistical analysis, provided supervision, managed project administration, and assisted with the final draft of the manuscript. Saeed RAM was responsible for sample collection, conducting interviews with participants, statistical analysis, and writing the original manuscript draft. Both authors read and approved the final version of the manuscript.

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