Original Article

Sociodemographic Correlates of Postpartum Depression: A Survey-Based Study

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Abstract

Objective: Post-partum depression (PPD) has been reported in about one-seventh to one-tenth of women. The aim of this study is to identify the demographic, obstetrics, social, and psychological risk factors of PPD among the eastern region of the United Arab Emirates.

Method: A community-based cross-sectional study was performed on 200 women who had a recent singleton pregnancy and delivered newborn within past six months via convenience sampling and email snowballing. Several demographics, obstetrics, social, and psychological factors of the respondents were assessed using a survey form. The Edinburgh depression rating scale (EDRS) was used for the identification of women with possible PPD. Descriptive statistics were utilized for the representation of demographic variables, whereas Chi-square test was employed to assess categorical variables. Also, logistic regression was applied to evaluate the association of investigated variables and PPD.

Results: The median EDRS score amongst the study participants was found to be 11 (0-26). The prevalence of PPD was found to be 57% in the studied population. Significant differences were observed in the adverse life events, emotional supports, marital conflicts and history of depression of the participants with and without PPD ($P < 0.01$). The risk factors significantly associated with PPD were age of the newborn (OR = 6.50, 95%CI: 1.17-19.91), marital relationship (OR = 4.15, 95%CI: 1.31-15.22), maternal educational level (OR = 5.10, 95%CI: 4.30-16.58), adverse life events (OR = 9.32, 95%CI: 1.33-35.32), and history of depression (OR = 5.24, 95%CI: 3.14-11.96).

Conclusion: Given the findings, there is an urgent need for policy initiatives to address the identified risk factors, such as improving access to education, strengthening supportive marital relationships, and providing comprehensive mental health services for pregnant women.

Key words: *Postpartum Depression; Risk Factors; Sociodemographic Factors; Cross-Sectional Study; United Arab Emirates*

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Postpartum depression (PPD) is characterized by the occurrence of depressive signs and anxiety symptoms in women of childbearing after childbirth, which affects the quality of life and impedes the care provided to the newborn (1). The onset of PPD can range between immediate post-delivery to six months after delivery. Clinical symptoms of PPD include low mood, anxiety, extreme tiredness, crying episodes, irritability, and disturbances in sleeping and/or eating patterns, with considerable effect on their daily routine. Although PPD symptoms wane over a few weeks to months, nearly 38% of women may have persistent depressive symptoms lasting throughout their lifetime (2).

PPD signifies a substantial public health problem affecting not only mothers but also their families. Sometimes it may lead to continuing and frequent depression, related with marital complications and disturbance in newborn behavior and development. The exact cause of PPD is not pinpointed; however, a blend of physical, enthusiastic, hereditary, social factors, hormonal changes and sleep deprivation, coupled with extra-care needed for the newborn, have been recognized as contributing factors. Major studies have shown that maternal screening during pregnancy has revealed that the most common diagnosis in screen-positive women includes major depressive disorder with generalized anxiety disorder (3). These studies have indicated that some sociodemographic attributes such as low income, young age, and low educational level are correlated with PPD symptoms (4).

The incidence of PPD affects 10-15% of women, among whom one-fifth have suicidal tendencies (5). Maternal depression during pregnancy has been associated with an increased odd of preterm birth and low birth weight (6). In addition, PPD has been associated with an increased risk of neonatal mortality to nearly three times at 6 to 12 months (7). Despite being a huge burden on the community, PPD is often under-recognized and under-treated, posing great challenges to primary healthcare providers (8). Women living in urban areas have a greater risk (40%) of PPD as compared to rural women (9). The survey studies on awareness of PPD from a developing nation revealed that only slightly over half (57.4%) of the population were aware of PPD (10). Early identification and treatment significantly improve the quality of mothers' lives (11). Despite PPD being known for decades, studies indicate that it cannot be easily prevented (7, 12).

Studies on PPD in Middle Eastern nations are limited (2). It is important to identify women at risk for PPD so that appropriate interventions can be directed to mitigate the risk and consequences of PPD. Most previous studies have investigated psychosocial and psychopathological aspects of PPD linked to romantic and maternal relationships, with less focus on the investigation of these factors together. The results from other studies cannot be assumed due to socio-cultural differences in the selected population. Hence, we envisaged the present study to evaluate the incidence and the associated risk factors for PPD among the eastern region of the United Arab Emirates women, aiming to enhance the quality of mother-baby dyad life. The objectives of this research were: (1) to confirm previous findings investigating sociodemographic risk factors of PPD, and (2) to provide a comparison of sociodemographic factors between women with and without PPD.

Materials and Methods

Study Design and Participants
A population-based cross-sectional study was conducted on 200 women between 1st March 2023 to 30th August 2023 on Emirati women from the eastern region of the United Arab Emirates, who delivered within past six months. Participants were recruited from available subjects by convenience sampling as well as social media (such as Facebook and Instagram) via email snowballing. Our inclusion criteria for this research were: (1) women who had delivered within past six months, (2) women with an official marital relationship, and (3) women with a singleton full-term pregnancy. Furthermore, the exclusion criteria were: (1) women with their newborns identified with any congenital anomalies or critical illness, (2) women with any complications during pregnancy, (3) women with a history of being diagnosed with any psychiatric disorder. The estimated sample size was 200, accepting the prevalence of PPD as 33% based on previous reports (2) with the 95% confidence interval and permissible margin of error of 5%.

Measures
The Self-Report Questionnaire (SRQ) form consists of demographic, socio-psychological and obstetrics factors of participants including age, income, housing situation, educational level, employment status, marital relationships, marital conflicts, history of depression, emotional supports, number of deliveries, number of planned pregnancies, gender of the infant, the mode of delivery, fertility assistance, and breastfeeding status.

The Edinburgh Postnatal Depression Scale (EPDS) was structured and sent to the participants to be answered. The Arabic version of the EPDS is a validated tool which is used for the assessment of postpartum depression symptoms (13). Overall, 10 items were used in the EPDS to evaluate the depressive symptoms of respondents that needed to be replied. For each item, a four-point scale was employed for the calculation of the EPDS that in turn measure the frequency of the depressive symptoms developed in the postpartum period. The maximum and minimum scores of the EPDS are 30 and 0, respectively. Further, a score of ≥ 10 was considered indicative of possible PPD in mothers. Subsequently, the data obtained from the study was analyzed using SPSS version 26 to ensure the reliability of the study. In addition, the reliability of the questionnaire was confirmed by using the

Cronbach's alpha indicator. The coefficient of reliability of et al
 0.5 was considered poor, 0.5-0.7 indicated reasonable reliability, and 0.8 was great.

Data Analysis
Descriptive statistics were used for the representation of demographic variables, whereas the Chi-square test was utilized to assess categorical variables. Numerical variables were measured for their normal distribution using the Kolmogorov-Smirnov test, after which either parametric or non-parametric tests was used. Logistic regression (95% CI and the odds ratio) was utilized to evaluate the association of socio-demographic and psychological factors and PPD. Data analysis was carried out using SPSS version 26 (IBM Corp. Released 2018. Version 26.0. Armonk, NY: IBM Corporation).

Ethical Consideration
The approval was obtained from the Dubai Pharmacy College Research Ethics Committee (Human Study Protocol) before initiating the study. Moreover, a well-versed written consent was attained from the women who participated in the study. Women who were not willing to contribute to the study was not forced to participate, no other personal identifications were included in the form.

All the data collected was kept confidential and used only for the study purpose.

Results

Demographic Assessment
The present work was conducted as a population-based cross-sectional study among 200 women belonging to the eastern region of the United Arab Emirates. Various demographic, pre- and post-natal care aspects, social, and physiological factors were investigated on the participating women. The demographic characteristics such as age, educational qualifications, employment status, and economical status of the participants were investigated. Among the 200 women participated in the study, the mean age of the respondents was 32.8 ± 6.3 years and the mean age of their husbands was 35.8 ± 6.3 years. Most of the participants were in the age group of between 30 and 35 years (Table 1). Significant associations were not observed between the age groups of the study participants and PPD (Table 2). The educational status of both participating women and their husbands was examined. The majority of the study participants were college graduates (88.5%) followed by secondary school graduates (11%), while 0.5% of the participants had completed primary school education (Table 1).

Table 1. Socio-Demographic Variables of the Postpartum Mothers to Investigate Sociodemographic Correlates of Postpartum Depression

Variables		Values
Mean (SD) age of study participants (in years)		32.8 (6.3)
Mean (SD) age of the husbands of the study participants (in years)		35.8 (6.3)
Educational level amongst study participants	University	177 (88.5%)
	Secondary school	22 (11%)
	Primary school	1 (0.5%)
Employed		132 (66%)
Annual income (in UAE Dirhams)	< 180,000	13 (6.7%)
	180,000-360,000	84 (43.1%)
	> 360,000	98 (50.2%)
Number (%) of women with planned pregnancy		121 (69.9%)
Number (%) of women with male newborns		104 (52%)
Number (%) of women with vaginal delivery		149 (75.3%)
Number (%) of women with marital conflicts		12 (6%)
Number (%) of women with history of depression		41 (20.5%)

Regarding the husbands' educational status, 69.5% were college graduates, 27% were secondary school graduates, and 3.5% had primary school education (Figure 1A).
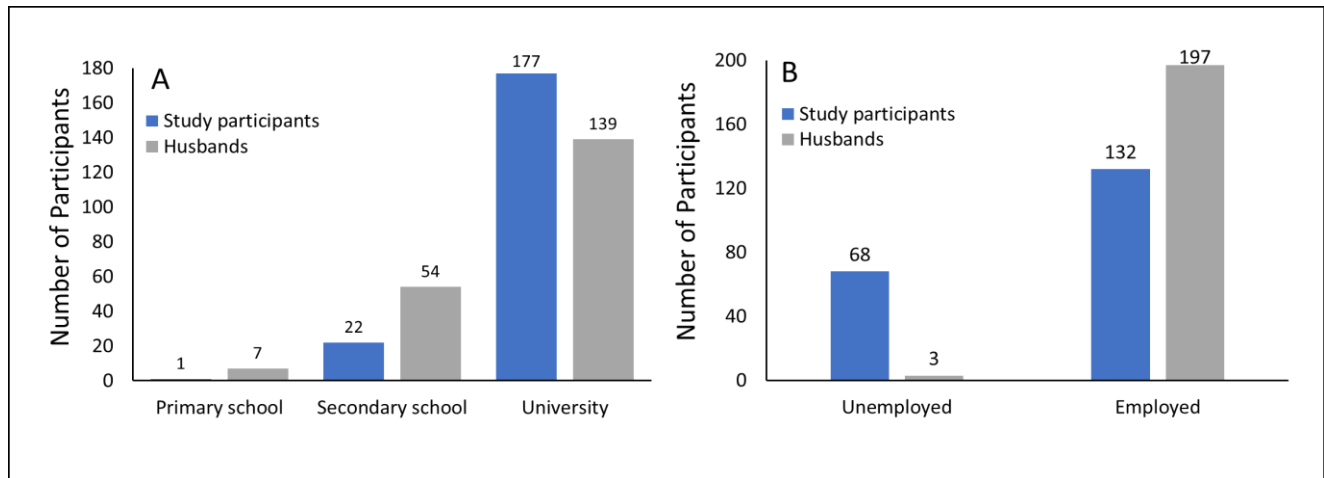

Figure 1. (A) The Proportion of Educational Backgrounds of the Postpartum Mothers and Their Husbands. (B) The Comparison of Employment Status of the Postpartum Mothers and Their Husbands.

The prevalence of PPD among university educated participants was found to be 83.3% (95/114), whereas 82 university educated participants did not have PPD (95.4%), and this was statistically significant (P = 0.02). Among the study participants, 132 women (66%) were employed, whereas 197 (98.5%) of their husbands had working jobs. The comparison of employment status between women and their husbands is depicted in Figure 1B. The percentage of employed women with PPD was found to be 35.1%, while the percentage of employed women without PPD was found to be 28 (32.6%), and the difference was not statistically significant (P = 0.7). Furthermore, we assessed the annual income of participants and their families. As shown in Table 2, no significant difference was observed in the annual income between the participants with and without PPD.

Table 2. Comparison of Factors between Patients with Possible Postpartum Depression and without Depression.

Demographical/ Socio-psychological factors		With postpartum depression (N = 114)	Without postpartum depression (N = 86)	p-values
Age group of the study participants (years)	20-25	14 (12.3%)	7 (8.1%)	0.09
	25-30	33 (28.9%)	14 (16.3%)	
	30-35	37 (32.5%)	33 (38.4%)	
	> 35	30 (26.3%)	32 (37.2%)	
Age group of the newborn (months)	0-3	35 (31.5%)	22 (25.9%)	0.2
	3-6	13 (11.7%)	13 (15.3%)	

	6-9	25 (22.5%)	12 (14.1%)	
	9-12	38 (34.2%)	38 (44.7%)	
	Primary school	0	1 (1.1%)	
Mothers educational level	Secondary school	19 (16.7%)	3 (3.5%)	**0.02***
	University	95 (83.3%)	82 (95.4%)	
Employment status of the study participants	Employed	74 (64.9%)	58 (67.4%)	0.7
	Unemployed	40 (35.1%)	28 (32.6%)	
	< 180,000	9 (8.2%)	4 (4.7%)	
Annual income category (in UAE Dirhams)	180,000-360,000	51 (46.4%)	32 (37.6%)	0.2
	> 360,000	50 (45.4%)	49 (57.7%)	
	Very good	69 (61.1%)	69 (80.2%)	
Marital relationship before delivery	Good	36 (31.9%)	16 (18.6%)	**0.008***
	Poor	8 (7%)	1 (1.2%)	
	Very good	63 (55.8%)	68 (79.1%)	
Marital relationship after delivery	Good	40 (35.4%)	18 (20.9%)	**0.001***
	Poor	10 (8.8%)	0	
	Yes	65 (70.7%)	25 (30.9%)	
Planned pregnancy				**0.0001***
	No	27 (29.3%)	56 (69.1%)	

Gender of the newborn	Male	55 (48.2%)	49 (57%)	0.2
	Female	59 (51.8%)	37 (43%)	
Number of previous pregnancies	None	6 (5.5%)	5 (5.9%)	0.08
	Once	36 (32.7%)	14 (16.5%)	
	Twice	24 (21.8%)	23 (27.1%)	
	More than twice	44 (40%)	43 (50.5%)	
Mode of delivery	Normal vaginal delivery	81 (72.3%)	68 (79.1%)	0.3
	Caesarean section	31 (27.7%)	18 (20.9%)	
Proportion of women with breast-feeding		80/114 (70.2%)	69/86 (80.2%)	0.1
Stay of study participants after delivery	Participants' own house	64 (56%)	61 (70.9%)	
	Participants parents' home	25 (22%)	15 (17.4%)	0.07
	Participants' husbands home	25 (22%)	10 (12.7%)	
Proportion of patients with adverse events in prior pregnancy/ies		48/113 (42.4%)	9/84 (10.7%)	**0.0001***
Proportion of patients receiving emotional support		81/113 (71.7%)	80/85 (94.1%)	**0.0001***
Proportion of patients with marital conflicts		12/81 (14.8%)	0/67	**0.003***
Proportion of patients with history of depression		38/89 (42.7%)	3/79 (3.8%)	**0.0001***
Proportion of patients with family history of depression		16/88 (18.2%)	7/79 (8.9%)	0.08

*-Statistically significant (p $\leq$ 0.05), Chi Square test

Obstetrics Details of the Study Participants

Among all the respondents, 121 (69.9%) women had planning for their pregnancy while 52 (30.1%) had unplanned pregnancies. In addition, 27 women responded "maybe" to this question. Surprisingly, 65 (70.7%) of women with PPD had planned pregnancies, whereas 25 (30.9%) women without PPD had planned pregnancies, and the result was statistically significant (P < 0.001) (Table 2). Furthermore, 104 (52%) women had male newborns, while 96 (48%) women had female newborns during their previous deliveries. The majority of the respondents had at least two previous pregnancies (Figure 2A). No significant associations were observed between the gender of the neonates and the number of previous pregnancies with PPD (P > 0.05). 149 women (75.3%) of the participants had a normal vaginal delivery, 49 (24.7%) had Caesarean section, and two participants did not reveal their mode of delivery. Furthermore, 149 (74.5%) respondents were breastfeeding presently, and 51 (25.5%) were not. 62.5% of women were staying in their own house after the present delivery, while 20% in their parents' home and 17.5% in their husbands' family homes. No significant associations were observed between the mode of delivery, breastfeeding status, and stay of study participants with PPD (P > 0.05).
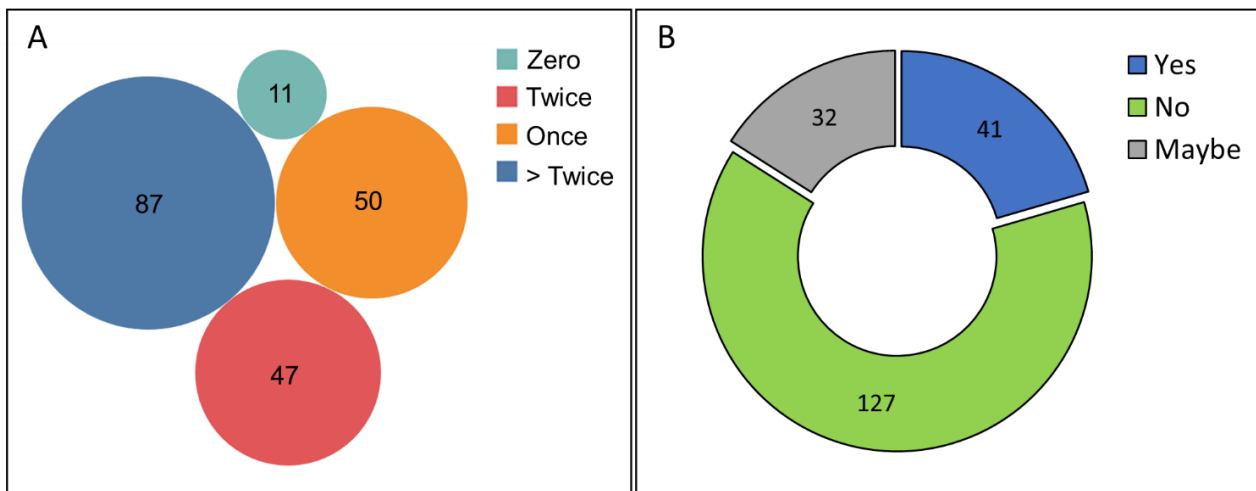

Figure 2. (A) Distribution of Number of Previous Pregnancies Amongst the Postpartum Mothers. (B) The Proportion of Postpartum Mothers with a Previous History of Depression.

Social and Psychological Factors

Among the participants, two women did not reveal whether they were concerned about their weight gain after pregnancy. However, 147 (74.2%) respondents were concerned about their weight gain, while 51 (25.8%) participants were not. Moreover, three women did not mention their previous adverse life events during their past pregnancies, while 50 (25.4%) respondents had such experiences in the past and 147 (74.6%) participants did not report any adverse events in their lives. Moreover, the investigation on emotional support after the delivery revealed that 161 women (81.3%) received emotional support and 37 (18.7%) women did not obtain the support and two women did not mention anything. A total of 136 (68.3%) participants had no marital conflicts, whereas 12 (6%) participants stated that they had marital conflicts, and 51 (25.7%) participants responded with "maybe". One woman did not report about the marital conflict. 41 (20.5%) respondents reported a previous history of depression, whereas 127 (63.5%) participants did not have any depression and 32 (16%) women stated "maybe" (Figure 2B). As shown in Table 2, significant differences were observed in the adverse life events, emotional supports, marital conflicts and history of depression of the participants with and without PPD (P < 0.01). In addition, 23 (11.5%) women stated having a family member with a depression history, 144 (72%) respondents did not, and 33 (16.5%) responded with "maybe" for this test item.

Edinburgh Postpartum Depression Scale

The median (range) EPDS score of the study participants was 11 (0-26). About half of the participants, 114 (57%) women, had their EPDS scores of 10 or above and met the criteria for possible postpartum depression. The comparison of various sociodemographic and psychological factors such as mother's education, pre- and post-delivery marital relationship, planned pregnancy, adverse life events in previous pregnancies, emotional support, and previous histories of depression were significantly associated with possible postpartum depression according to the EPDS (Table 3). Logistic regression analysis revealed a good model with Nagelkerke R^2 of 71.7% and the above mentioned variables were significantly associated with possible postpartum depression according to the EDRS. The summary of odds ratios (95% confidence intervals) and P values for the individual items are tabulated in Table 3. The risk factors significantly associated with PPD were age of the newborn (OR = 6.50, 95%CI: 1.17-19.91), marital relationship (OR = 4.15, 95%CI: 1.31-15.22), maternal educational level (OR = 5.10, 95%CI: 4.30-

16.58), adverse life events (OR = 9.32, 95%CI: 1.33-35.32), and history of depression (OR = 5.24, 95%CI: 3.14-11.96).

Table 3. Summary of Significant Variables Observed in the Logistic Regression Analysis for Possible Postpartum Depression According to the Edinburgh Depression Rating Scale

Variables		Odds ratio [95% confidence interval]	P-values
Age of the newborn	0-3 months compared to 3-6 months	6.50 [1.17, 19.91]	**0.047**
others educational level	Secondary school compared to university level	5.10 [4.30, 16.58]	**0.003**
Marital relationship before delivery	Poor compared to very good	4.15 [1.31, 15.22]	**0.008**
	Good compared to very good	3.08 [1.90, 5.76]	**0.009**
Adverse events during a previous pregnancy	Presence compared to the absence of prior adverse events	9.32 [1.33, 35.32]	**0.025**
Previous history of depression	Presence compared to absence of history	5.24 [3.14, 11.96]	**0.01**

Discussion

In the present work, we identified the incidence and associated factors of PPD among post-delivery mothers in the eastern region of the United Arab Emirates. The prevalence of PPD was found to be 57% which is significantly high compared with the current estimates indicating an incidence of around 20% in low- and middle-income countries and 10% in high-income countries. A systematic review evaluating the prevalence of PPD in Arab countries concluded that 12 studies reported PPD occurrence was between 15 and 25 %, 7 studies reported a prevalence of less than 15%, and 6 studies reported a prevalence of < 25 % (14). Few research groups reported a vast difference in the prevalence of PPD in Arab women ranging from 10-80% (14, 15). The cultural differences among studied population (the eastern region of UAE) could be a possible reason for a greater proportion of women with PPD as compared to others (16). Furthermore, we have included women who delivered between 0 and 6 months before, which might have led to recall bias while answering the questions.

Many previous research studies have investigated the sociodemographic, obstetric and psychological correlates of PPD (17-19), although the findings are generally inconsistent. Here, among various social, physical, and demographic parameters, mothers' educational level, husbands' educational level, marital relationship before delivery, planned pregnancy, adverse events in previous pregnancies, emotional support, and previous history of depression were the factors significantly associated with possible PPD. The risk factors significantly associated with PPD were age of the newborn, marital relationship, maternal educational level, adverse life events, and history of depression. Several studies have pointed out the connection between postpartum depression and a history of depression prior to childbirth, highlighting these as significant factors contributing to the development of postpartum depressive symptoms (20, 21). It has been observed that the presence of mental health conditions like depression during pregnancy serves as a strong indicator for the risk of experiencing postpartum depression (22, 23). Studies suggest that women with a prior history of depression may be more vulnerable to hormonal fluctuations during the postpartum period (24). Notably, individuals with a history of moderate to severe premenstrual syndrome are particularly susceptible to the onset of postpartum depression, as alterations in the serotonin transport system, specifically related to serotonin transporter polymorphisms, have been linked to major depression (25, 26). A high serotonin polymorphism may lead to tryptophan depletion and subsequently trigger postpartum major depression (27).

Other predisposing risk factors for postpartum depression include a negative attitude towards the recent pregnancy, the number of stressful life events experienced, a history of past sexual abuse, concerns about the gender of the baby, low self-esteem impacting parenting stress, and various additional factors (28, 29).

In the present work, we observed that a good relationship between the couples is less likely to lead to maternal PPD. Some previous studies stated that women with poor-partner support had an increased risk of PPD compared to single/unpartnered women (30). Even in developed countries, the risk of PPD has been increased by 5 times when there is poor or minimal support during childbirth. Further, any marital dysfunction like absence of any support, or verbal, emotional or physical abuse has been shown to have adverse health implications both for women and babies (31). Some previous reports stated that quality of relationship with husbands has been the key predictive factor for maternal PPD, and a very good relationship nullifies the occurrence of PPD (32). In fact, Faisal-Cury *et al*. observed that low partner relationship quality had a risk of 1.58 and a decline in sexual life had a risk of 1.97 with PPD even after altering for perinatal depression (33). The decrease in social support stands out as a key environmental influence on the emergence of depression and anxiety disorders. Discussions at the International Conference on Population and Development have underscored that enhancing decision-making autonomy within the household and bolstering partner support are crucial steps toward enhancing women's reproductive health. Instances of spousal sexual violence and other forms of domestic abuse during pregnancy are recognized as key factors that contribute to the development of postpartum depression (34-36). All these findings revealed the importance of taking maternal history and continuous psychological support to be provided by the health care team as well as by family members all over the pregnancy as well as during postnatal period for women with prior histories of depression.

Limitation

It is important to consider various limitations when interpreting the findings. The majority of the participants in the study were well-educated, married, first-time mothers or had one additional child, and had an income above the average. Consequently, the results may have limited generalizability to single mothers and individuals from diverse cultural backgrounds or less privileged socioeconomic statuses, which are known risk factors for postpartum depression. Furthermore, as mentioned, we have included women who delivered between 0 and 6 months before that might introduce recall bias while answering the questions. The current study was cross-sectional, which certainly has important limitations compared to longitudinal and cohort studies. One disadvantage of cross-sectional studies compared to longitudinal and cohort studies is that they provide a snapshot of data at a single point in time, limiting the ability to observe changes and trends over time. Therefore, the findings of the research do not allow for drawing conclusions about the causal relationships between the variables related to birth, postnatal period, and emotional states.

Conclusion

In the present work, we investigated the incidence and associated risk factors of PPD among Emirati women from the eastern region of the United Arab Emirates. Several socio-demographic factors such as mothers' educational level, husbands' educational level, marital relationship before delivery, planned pregnancy, adverse life events in previous pregnancies, emotional support and previous history of depression were the risk factors significantly associated with possible PPD. Controlling and addressing the hazards and challenges would be essential for future studies and the development of successful interventions that meet the needs of mother-child dyad and their relationship. Given the findings, there is an urgent need for policy initiatives to address the identified risk factors, such as improving access to education, strengthening supportive marital relationships, and providing comprehensive mental health services.

Acknowledgment

Conflict of Interest

None.

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