ORIGINAL RESEARCH article

Postpartum depression and associated risk factors in Libya

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Abstract: Postpartum depression is a major maternal health problem after childbirth. It can start at any time within the first year after delivery and continue for several years. It is characterized by an inability to experience pleasure, anxiety symptoms, panic attacks, spontaneous crying and depressed mood. Some women with postpartum depression even have thoughts of harming their child and self-harm. This study aims to find out the status of postpartum depression and the associated factors among postnatal mothers at the first, fourth and sixth month. This study is a prospective descriptive study, carried out in three major health facilities in Misurata. This study consists of a three-part questionnaire. Part 1 covers the demographic characteristics of the participants, while Part 2 explores the associated risk factors according to the variables used. Part 3 consists of the psychological evaluation of the participants. A hundred mothers (ages between 15 and 43 years) were enrolled in this study. The findings revealed that the prevalence of depression is 60.0% and 22.0% are suffering from borderline depression. Development of depression was strongly correlated with sleeping disturbances, the state of the neonate after birth, excess consumption of stimulants, less weight acceptance by mothers during pregnancy and infant illness. There was a weak relation between depression and delivery state, maternal admission to the hospital during the current pregnancy, and infant gender dissatisfaction. No correlation was found with the development of depression regarding miscarriage, maternal medical problems after delivery, previous child sex, maternal age, education, parity or neonate weight. Thus, this study shows that the chance of having a miscarriage and an unhealthy neonate increases with advanced maternal age. It also shows that caesarean section is associated with bad neonatal outcomes, more weight gain and having gestational diabetes or preeclampsia during pregnancy. Maternal sleeping problems are more pronounced in the first month, attributed to the baby's care, compared with the fourth and sixth months. The study indicates that depression is a common state of psychiatric disorders among Libyan women and should have appropriate attention by physicians and gynecologists.

Introduction

Pregnancy is a physiological condition that is life altering experience and can be different for every woman. The pregnancy period lasts for about 40 weeks and the woman experiences many emotional, physical, mental and spiritual changes during this period [1]. However, after childbirth, a mother can experience varied

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emotions ranging from joy and pleasure to sadness and crying bouts. Most new mothers have these feelings in a mild form called baby blues which often subside in a few hours or a week. However, some women can develop postpartum depression (PPD). Globally, PPD is a significant health issue that can impact the health of the mother, her marital relationship, interaction with the newborn as well as infant growth [2]. The first symptom of PPD, usually appears within four weeks of delivery, which can range from mild to severe [3]. Women with PPD can suffer from some common symptoms such as sleep disorder, irritability, inability to experience pleasure, anxiety symptoms, panic attacks, spontaneous crying and depressed mood [4-6]. Some women with PPD even have thoughts of harming their child and self-harm [5, 6]. However, depression is treatable, untreated postpartum depression or non-diagnosis of PPD can have a prolonged adverse effect on the mother and her children [7]. Worldwide, the prevalence of PPD ranges from 05.0%-60.0% [8]. The prevalence of PPD is high in developing countries where psychological issues are mostly ignored [9].

Numerous studies have demonstrated many factors associated with PPD including obstetric history, mode of delivery [10] and biochemical genetic [11, 12] as well as social stressors such as age [13], socio-economy [14, 15], culture [16], education and negative life events. To prevent or minimize PPD, an early treatment of PPD is likely to reduce public sector costs, increase earnings and improve quality of life for women [17]. Thus, determining the prevalence rate of postpartum depression and identifying associated risk factors is an important issue to illustrate the magnitude of the problem. With regard to postnatal depression, to the best of our knowledge, no previous studies have been reported to indicate a prevalence of the mental status of the mother after delivery in Libya. The main aim of this study is to find out the status of postnatal depression and risk factors associated among the postnatal mothers attending different health facilities at first-, fourth- and sixth-month post-delivery in Libya.

Materials and methods

This is a prospective descriptive study conducted in three health facilities in Misurata, a large city located east of Tripoli by 200 Km, Libya. The major health facilities included in the study were: Misurata Central Hospital, Algoshi Health Center, and Algheran Health Center. The study conducted for a period of two months included 100 mothers (age 15-43 years). Mothers at first; fourth and sixth months after delivery were enrolled. Mothers who gave birth less than one month and more than six months were excluded from this study. Data were gathered using a three-part validated questionnaire by a direct self-interview with the women at the health facilities by the main investigators. Part I covers questions on the subject's demographic characteristics including the mother age, educational level, baby`s age, baby's gender, previous child`s sex, delivery state and parity. Part II contains questions exploring risk factors according to the variables used such as obstetric-related variables, delivery and pregnancy-related complications such as neonate state after delivery, the infant health, neonate weight, breast-feeding pattern, maternal weight acceptance during the current pregnancy, mother`s history of admission to hospital during the current pregnancy, history of miscarriage, presence of diseases after delivery, sleeping disturbance and consumption of stimulants during and after delivery. Part III of the questionnaire constituted for psychological evaluation. The depression module of the questionnaire that is used in this study is constituted of 10 depression criteria using the Edinburg postnatal Depression Scale [18]. The maximum score: was 22. Women were considered to suffer from depression if they scored 11 or more. A score of 6-10 was considered as borderline (mild) depression. While a score less than six was considered as not depressed woman.

Statistical analysis: Both descriptive and comparative statistics were used. Analysis of the data by using the following: frequency distribution, percentage, standard deviation and Spearman correlation test were used. A *p*<0.05 was considered to be a statistical significance difference.

Results

In **Table 1**, out of the 100 participants, 18.0% were found to be not depressed (score<6), 22.0% of the participants had borderline depression (score 6-10) while 51.0% had depression (score ≥11) and those who had severe depression (score ≥18) composite of 09.0% in the study sample. Hence, the prevalence rate of PPD was found to be 60.0%. Regarding severe depression, this class was among women in the age group of 20-35 years. Depression was further classified according to the period spent with the depressed mood, as reactive, for mothers who were depressed in the first month after delivery, moderate, for those in the fourth month and chronic for those in the sixth month after delivery. The present results show that only one participant (04.5%) in the first month was not depressed, six participants had borderline depression (27.2%) nine participants had reactive depression (40.9%) and six women suffered from severe reactive depression (27.2%). Six participants at four months after delivery were not depressed (15.7%), ten participants had borderline depression (26.3%) and 22 participants had depression (moderate) (57.8%), however, none of the women in this group suffered from severe depression. Regarding the participants in the sixth month after delivery, 11 participants were not depressed (27.5%), six had borderline depression (15.0%), 20 participants had chronic depression (50.0%), and only three participants suffered from severe chronic depression (07.5%).

Table 1: Occurrence of postpartum depression among Libyan postnatal mothers

Study variables			Number and percentage (n = 100)		
Degree of depression					
No depression			18.0%		
Borderline depression			22.0%		
Depression			51.0%		
Severe depression			09.0%		
Degree of depression according to the period spent with depressed mood n (%)					
Period	Not depressed (<6)	Borderline depression (6-10)	Depression (≥11)	Severe depression (≥18)	**Total**
1 month	01 (04.5)	06 (27.2)	09 (40.9)	06 (27.2)	**22**
4 months	06 (15.7)	10 (26.3)	22 (57.8)	00 (00.0)	**38**
6 months	11 (27.5)	06 (15.0)	20 (50.0)	03 (07.5)	**40**
Total	**18**	**22**	**51**	**09**	**100**

Data as shown in **Table 2**, regarding the maternal age and its relationship with the development of depression indicates that four participants (36.3%) under the age of twenty had depression while 46 of the participants in the age group between 20-35 years had depression (60.6%). In the age group over 35 years, 10 participants had depression (77.0%, **Figure 1**). However, the Spearman correlation test was found to be very weak - 0.091 with p=0.369, the development of depression is not related to advanced maternal age. Concerning the educational level of the participants, 20 participants had depression (51.2%) and had basic education, 20 participants with high school education had depression (69.0%) and in participants with a college education, 20 had depression (62.5%). The correlation was 0.072 with p=0.479, the mother's educational level was irrelevant to the development of depression (**Figure 2**). The findings also show that 28 of the participants who had female babies developed depression (66.7%), however, among women who had male babies, 32 participants had depression (55.2%) as it is shown in **Figure 3**. A Spearman correlation test for the female gender and development of depression revealed a very weak 0.116 with p=0.251. Women who had female babies had a slight chance of developing depression while the correlation for the male gender was also weak -0.116 and p=0.251. The development of depression was inversely correlated with the male gender; mothers who had male babies were less likely to develop depression.

With regard to the previous child's sex, having a baby with the same sex as the previous child was irrelevant to the development of depression. Among 26 participants who had a baby not having the same sex with the previous child, 20 developed depression (76.9%) while among 46 participants who had a baby with the same sex as the previous child, 28 had developed depression (60.8%). The correlation was -0.215 and p=0.032. However, most of the study population were primiparous (have one child), followed by two children, three, or more than four, and the last are those having four children. Also, parity was irrelevant to depression (r=0.021, p=0.838).

The current study also shows that delivery by cesarean seems to be associated with the risk of developing depression, 20 participants delivered by cesarean section developed depression (71.4%) compared with a normal delivery 40 participants developed depression (55.6%) as shown in **Figure 4**. However, this relationship was weak with regarding correlation (0.145, p=0.149). In this study, it is found that admission of the neonate to NCU had a marked effect on the development of depression among the mothers, 22 of the participants who had their babies admitted to NCU developed depression (88.0%) while this number decreased to 38 among mothers who had normal healthy baby (50.7%) as shown in **Figure 5**. It is statistically significant, r=0.354, p=0.001, mothers who had unhealthy neonates were more likely to develop depression. There is also no relation between the development of depression and low body weight, only 16 of the participants who had neonates with low body weight developed depression (57.1%), while 34 of mothers who had neonates with normal body weight developed depression (61.8%) and 10 of mother who had neonates with body weight more than the normal range (>4.0 Kg) also developed depression (58.8%) with correlation of 0.036, p=0.719. Having a neonate with low body weight does not affect the chance of developing depression at all. Also, there is a relation between infant illness and the development of depression among their mothers, 34 participants who their babies got till developed depression (72.3%) while 26 of the participants who their babies who did not get an illness developed depression (49.1%) as presented in **Figure 6**, this is statistically significant (r=0.266, p=0.007).

The finding shows that there is a relationship between the less acceptance of weight while pregnant and the development of depression; those mothers were at a high risk of developing depression after delivery; among them 34 developed depression (72.3%) while in the group of women who accepted their weight, 26 developed depressions after delivery (49.1%, **Figure 7**). This is statistically significant (r=0.236, p=0.018). More, the results seem to show a relationship between a history of miscarriage and developing depression. Thus, 27 of the participants who had a previous history of miscarriage developed depression after the current pregnancy (61.3%), while in the group of participants who did not have a previous history of miscarriage, 33 developed depression (59.0%). However, the correlation was very weak (r=0.040, p=0.691). It is found that admission to hospital during current pregnancy is associated with the development of depression after delivery, 29 of the participants who were admitted to the hospital developed depression (69.0%) while among the participants who were not admitted to the hospital; 31 developed depression after being delivery (53.5%), however, this relationship was weak with Spearman correlation test (r=0.157, p=0.118). Present data revealed that having a disease among women after delivery was associated with a higher chance of developing depression, 21 participants who had disease after delivery (61.8%) developed depression while 39 of the participants who did not have disease after delivery developed depression (59.1%). However, this relationship was very weak (r=0.026, p=0.798). It also shows that sleeping pattern changes after delivery is associated with higher risk of developing depression with 54 of the participants who had sleeping disturbance (initial insomnia, middle insomnia, terminal insomnia) developing depression (73.0%), on the other hand, six women who had normal sleeping habit developed depression (23.1%, **Figure 8**). This is statistically significant with a correlation of 0.432 and p=0.00 indicating women who had sleeping disturbance were more likely to develop depression.

Table 2: Demographic characteristics and factors associated with postpartum depression

Characteristics	Total n (%)	Postpartum depression n (%)	r	p
Maternal age in years			*- 0.091*	*0.369*
< 20	11 (11)	04 (36.3)		
20 - 35	76 (76)	46 (60.6)		
> 35	13 (13)	10 (77.0)		
Education level			*0.072*	*0.479*
Basic education	39 (39)	20 (51.2)		
High school	29 (29)	20 (69.0)		
College	32 (32)	20 (62.5)		
Baby gender				
Female	42 (42)	28 (66.7)	0.116	*0.251*
Male	58 (58)	32 (55.2)	*- 0.116*	*0.251*
Previous child sex			*- 0.215*	*0.032*
Same-sex	46 (46)	28 (60.8)		
Not same sex	26 (26)	20 (76.9)		
Parity (No. of children)			*0.021*	*0.838*
Delivery state			*0.145*	*0.149*
Normal	72 (72)	40 (55.6)		
Caesarian	28 (28)	20 (71.4)		
State of the neonate after delivery			*0.354**	*0.00**
Admitted to NICU	25 (25)	22 (88.0)		
Normal healthy baby	75 (75)	38 (50.7)		
Neonate weight			*0.036*	*0.719*
Low body weight (< 3.0 Kg)	28 (28)	16 (57.1)		
Normal body weight (3 - 4 Kg)	55 (55)	34 (61.8)		
High body weight (> 4 Kg)	17 (17)	10 (58.8)		
Infant health (Presence of disease after delivery)			*0.266**	*0.007**
Bad health	47 (47)	34 (72.3)		
Good health	53 (53)	26 (49.1)		
Maternal weight acceptance during current pregnancy			*0.236**	*0.018**
Women who accepted their weight	53 (53)	26 (49.1)		
Women who did not acceptance their weight	47 (47)	34 (72.3)		
History of miscarriage			0.040	0.691
Previous history of miscarriage	44 (44)	27 (61.3)		
No history of miscarriage	56 (56)	33 (59.0)		
History of admission to hospital during current pregnancy			*0.157*	*0.118*
Admitted	43 (43)	29 (69.0)		
Not admitted	57 (57)	31 (53.5)		
Presence of disease after delivery			*0.026*	*0.798*
Women who had disease	34 (34)	21 (61.8)		
Women who not had disease	66 (66)	39 (59.1)		
Sleeping disturbance			*0.432**	*0.00**
Sleeping disturbance	74 (74)	54 (73.0)		
Normal Sleeping habit	26 (26)	06 (23.1)		
Stimulants consumption after delivery			*0.369**	*0.00**
Higher stimulants intake	74 (74)	50 (67)		
Women who did not consume any stimulants	26 (26)	10 (38.4)		

*Significant different by p < 0.05

Also, the higher stimulant intake after delivery is associated with depression, 50 participants who consumed stimulant drinks such as tea, coffee or both after delivery had depression (67.5%) while 10 women who did not consume any stimulant drinks after delivery developed depression (38.4%, **Figure 9**). This is statistically significant with a correlation of 0.369, *p*=0.01
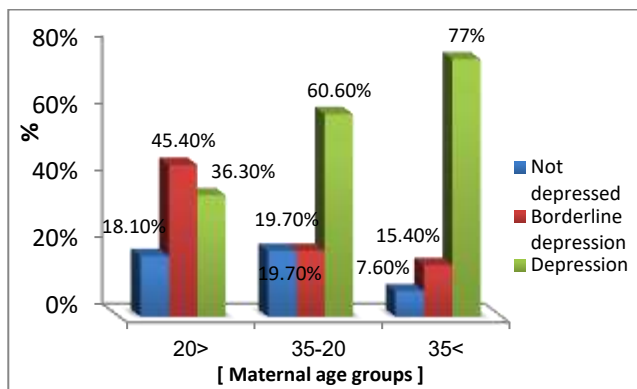

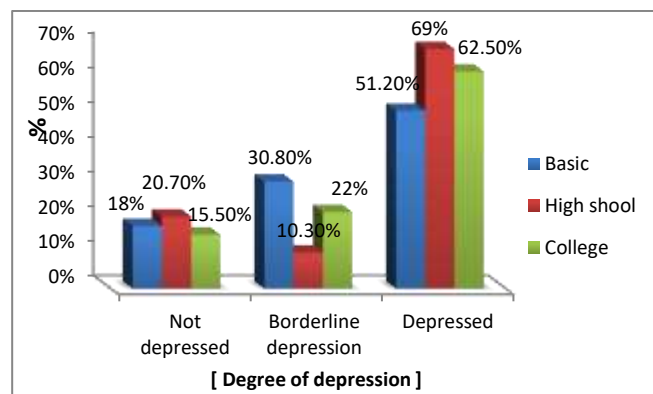**Figure 1:** Degree of postpartum depression and maternal age in Libya

Figure 2: Educational level and degree of postpartum depression
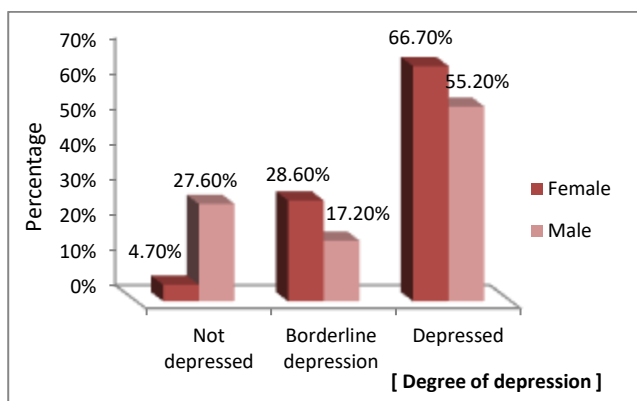
Figure 3: Baby gender and degree of postpartum depression
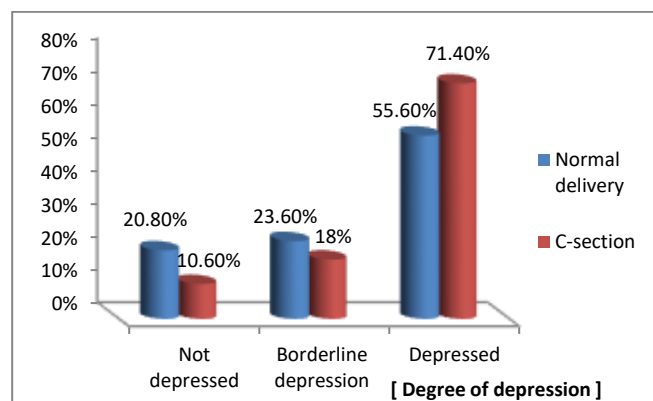
Figure 4: Delivery state and the degree of postpartum depression
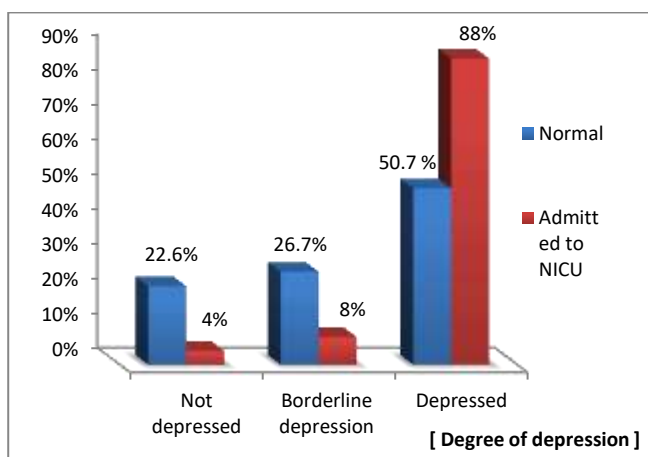
Figure 5: State of the neonate after delivery and degree of postpartum depression
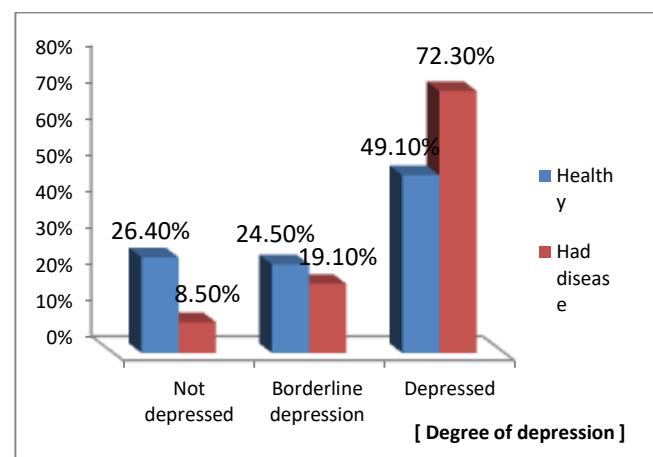

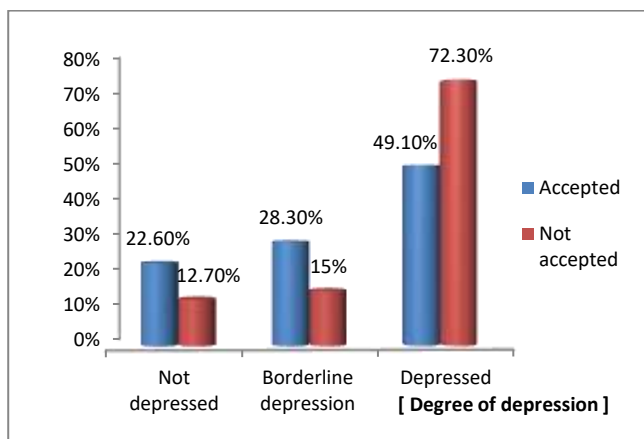**Figure 6:** Infant health and degree of postpartum depression

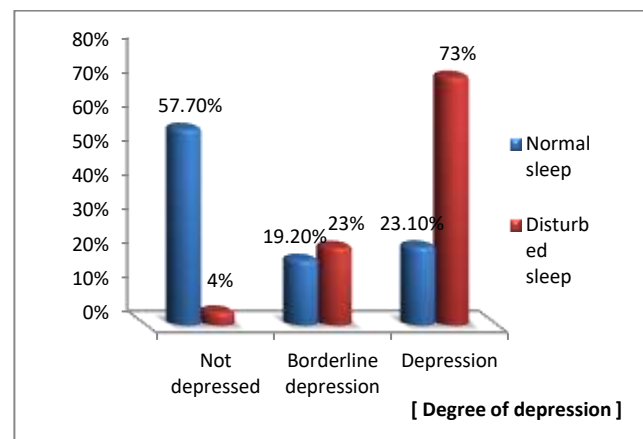**Figure 7:** Maternal weight acceptance during pregnancy and degree of postpartum depression

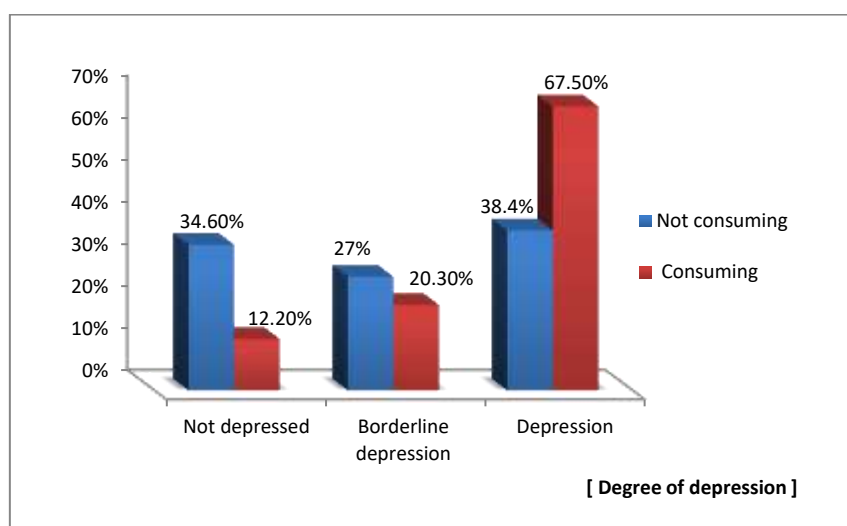**Figure 8:** Sleeping patterns and degree of depression

Figure 9: Consumption of stimulant drinks and degree of postpartum depression

Discussion

The postpartum period is recognized as a high-risk period for the development of various mood disorders like postpartum depression. Globally, postnatal depression is a serious public health problem that has a negative impact on the mother's health and child development, especially in developing countries. The finding of this study revealed that about 20.0% of the participants were not depressed (score <6), 20.0% had borderline depression (score: 6-10) and about 60% were depressed person (score ≥11). Al-Maghur and others [19] reported that 42.0% of the participants had depression in a study carried out in Tripoli. A meta-analysis study of PPD in India, Turkey and countries in the Middle East found a comparable pooled prevalence of postpartum depression which is 22.0%, 24.0% and 27.0%, respectively [20-22]. The prevalence rate was higher in our study compared with studies carried out in Canada, Denmark, Uganda (Kampala) and Egypt which were reported to be 01.6%, 05.5%, 06.1% and 07.1%, respectively [23-26]. The prevalence of depression was significantly high in our group; this rate of prevalence may have several reasons. Obstetric clinicians ignore both depression and other psychiatric disorders during pregnancy. On the other hand, women often are hesitant to ask for help because of the shame (shyness), cultural expectations or misbelief that their feelings are normal reactions to this new condition. The high rate might also be due to the use of different measurement tools,

study design and sample size. The present study showed a strong relationship between the state of the neonate after delivery and the development of depression, 88.0% of the mothers who had their babies admitted to NICU developed depression. These results are in line with Gawass and co-workers [19] reported that 58.0% of women whose neonates were admitted to NICU developed depression. Also, the development of depression was strongly associated with sleeping disturbances after delivery, about 75.0% of women who had sleeping disturbances developed depression, this percentage is very high compared to other studies and the majority of the depressed women reported having trouble falling asleep at night, attributing the baby as the cause of the sleep problems. In a study carried out in Nepal investigating sleep and its relation to depression in women after delivery, the prevalence of depression among women with sleeping disturbance was found to be 16.5%. A similar study in Norway reported that depression is associated with poor sleeping after delivery with a prevalence of 58.0% [27]. Other studies also show that there is the relationship between less sleep and PPD [28, 29]. Another variable that is not reported in other studies is the excessive stimulants consumption after delivery (coffee, tea) was associated with depression in this study (prevalence=67.5%), the reason may be that women who consume more coffee or tea would be more susceptible to have poor sleeping, which is may correlate to depression. In the present study, regarding infant illness, about 70.0% of the participants whose babies had an illness after birth developed depression. An infant with Illness needs more care, hospitalization and sometimes separation from mothers. Self-accusation by the mother or negative comments from others about infant illness especially congenital anomalies induces guilt feeling or depression. Tashakori and others [30] reported that infant illness predisposes to the development of depression in Iran. Infant gender dissatisfaction had a strong relation with depression, in the Iranian study reported that the preference for male children and negative reactions of family members to female children may cause or exacerbate depression. Similar findings have been documented from the developing countries Nigeria, India, Turkey and China where they reported female gender of the newborn a risk factor for depression whereas the boy is preferred in these cultures [27, 30].

In this study, weak relation between delivery by cesarean-section and depression exists, with similar results regarding cesarean-section and its relation to depression [19]. However, the delivery state and its relation to the development of depression have contradictory findings, in a study conducted in Lebanon that normal delivery is significantly associated with depression and that cesarean-section decreased the risk of depression [31]. Tashakori and others have reported that the delivery state is irrelevant to the development of depression [30]. Furthermore, in the current study, hospital admission during pregnancy was weakly correlated to depression after delivery. These results were consistent with the finding of a previous study conducted in [30]. Pregnancy is often accompanied by positive behavioral and attitudinal changes with regard to eating and weight but it seems that underlying concerns about eating and weight persist and may reemerge as pregnancy progresses. The postpartum period is a vulnerable time for weight concerns. In the early postpartum period, a majority of women are carrying more weight than they did before pregnancy and, in contrast to pregnancy, may no longer attribute the weight gain to positive aspects of providing for developing infants [32]. In this study, less weight acceptance by mothers seems to be positively associated with depression after pregnancy, about half of the mothers who did not accept their weight during pregnancy tried to lose weight in early postpartum. Moreover, about 75.0% of the mothers who did not accept their weight developed depression. However, no studies suggest a relation between maternal weight acceptance during pregnancy and the development of depression after delivery. Available studies are relating maternal weight with depression during pregnancy or weight concerns in the early postpartum and its relation to depression [32]. The present study also reveals no relation between educational level and maternal age. However, several studies reported that lower education is associated with depression. A low educational level prevents access to most professional jobs and increases vulnerability to psychiatric disorders. In addition, women with higher educational level may have high self-esteem, high intellectual function and better coping strategies [30, 33].

On the other hand, women with higher education and at a young age were more likely to develop depression [19]. Several studies suggest no relation exists between educational level and age with the development of psychiatric disorders [27, 34]. This finding is inconsistent with the present findings. In a previous study by Silva and others [35], the highest level of depression has been reported in mothers aged 13-19 years while the lowest rate has been seen in women with the age range of 31-35 years old. Also, our study identifies no significant association between parity and the occurrence of postpartum depression while parity was associated with PPD [36]. The current finding showed no relation between previous child sex, miscarriage experience and presence of medical problems after delivery and neonatal weight with the development of depression among enrolled mothers. In a previously published study, mothers with higher parity are less likely to develop depression and the miscarriage experience was associated with depression [19, 27]. Despite several risk factors studied in this study, other factors were not reported like lower socioeconomic status, stressful life events during pregnancy or early postpartum, lack of social support from women's relatives, and relationship problems with the husband [37, 38].

Conclusion: This study reports that postpartum depression is a common state of psychiatric disorders among women in Libya. This issue should have appropriate attention from physicians, gynecologists, and other health care provider.

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