

Prevalence and Factors of Postpartum Depression among Mothers at King Abdulaziz University Hospital

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Abstract

Postpartum depression (PPD) is a common medical condition which the mother goes through after child birth. PPD affects approximately 10-20% of postpartum mothers and is categorized by unhappiness, continuous crying, difficulty sleeping, appetite change, difficulty concentration or making decisions, feeling overwhelmed, and lack of interest in normal activities. **The aim of the study:** to assess the prevalence and factors of postpartum depression among mothers at King Abdulaziz University Hospital. **Design:** quantitative descriptive cross-sectional design was used. **Setting:** Well-Baby and Obstetrics Clinics in King Abdulaziz University Hospital. **Sample:** a convenience sample of 160 women who were 1 to 6 months postpartum. Data was collected over three months from March 2018 to the end of May 2018. **Tools:** two tools were used in this study tool one: a structured, interview questionnaire was developed by the researcher to collect data about socio-demographic data, medical surgical history, reproductive history and life style habits and experiences. Tool two: Edinburgh Postnatal Depression Scale (EPDS). **Result:** it was observed that more than three quarters of the participants (88.0%) had some symptoms of distress that may be short-lived and are less likely to interfere with day to day ability to function at home or at work. However, if these symptoms have persisted more than a week or two further enquiry is warranted, while only 12.0% of them had indicates, the presence of symptoms of distress that may be discomforting. Repeat the EPDS in 2 weeks time and continue monitoring progress regularly. If the scores increase to above 12 assess further and consider referral as needed, however, none of the participants had a score above 12 on the EPDS. **Conclusion and recommendations:** postpartum depression usually begins around the 4 week following child birth; however, it may begin at any time during the first 12 months after delivery. Motivate maternity nurses and midwives to join professional organizations that promote postpartum depression education to continually enhance their knowledge.

Key words: postpartum depression, postpartum women, prevalence, risk factors, EPDS.

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Introduction

Childbirth is assumed to be a life-changing event for the postpartum mothers as well as the family.¹ The postpartum period is a joyful time for celebration for the mothers and their family, where a new member

is added to the family and pregnancy is ended. Unfortunately, mothers can experience many health problems and complications after child birth that can affect their health and wellbeing of the mother as well as the newborns health and the health of the family as a whole.¹ Depression is a serious health problem that affects postpartum mothers and it is common after child birth. According to the Center of Disease Control (2017), reported that 1 in every 10 women show signs of depression in the United States. However, 1 in every 9 mothers in the United States show signs of postpartum depression (PPD). The percentage of mothers that are effected by PPD vary according to their age and race/ethnicity.²

Postpartum blues or “baby blues” usually starts 1- 3 day after delivery and peaks at day 5 and diminishes around day 10 after child birth.³ Approximately 85% of mothers after giving birth will experience signs of postpartum blues; feelings of being overwhelmed, sadness, cry easily, mood swings, anxiety, tiredness, feeling of failure, headache, feeling unhappy and fatigue. It is a mild, temporary stage of emotional changes and it may last up to 2 weeks.⁴

Postpartum depression or depressed mood resembles postpartum blues except is more severe and persistent. It effects around 12% of newly mothers. There are three severities of PPD mild, moderate, or severe, the severity of the signs increases with each severity of depression.⁵ The first severity of PPD is mild, the mother cares for the infant but cannot love it. She might be feeling the following: irritability, blame, humiliation, worthlessness, and a feeling loss of self. The signs continue beyond the first couple of weeks following child birth. The second severity of PPD is moderate, it is described as spontaneous crying, un-ability to sleep or sleeping to much, exhaustion, reduced concentration, and food cravings. The last severity of PPD is severe, the experiences irritability that could cause the mother to become violent or uncontrollable crying. Mothers do not talk about their signs or their negative feelings or their negative feeling for the infant, such as: disinterest, irritation, or even thoughts of injuring the infant. In this cause if psychotherapy and pharmacological are not enough hospitalization maybe required.³

Postpartum psychosis is the most dangerous type of postpartum of depression. Postpartum psychosis effects 1 to 2/1000 mothers within the first 2 to 4 weeks following child birth, however, it can occur within 2 to 3 days postpartum. Postpartum psychosis is characterized by “paranoid, grandiose, or unusual hallucinations, mood changes, disordered thoughts, confused and a noticeable difference in behavior. Postpartum psychosis is the most uncommon type of PPD. It effects around 10 to 13% of newly mothers. However, postpartum depression or postpartum blues effect 50 to 75% of newly mothers. Postpartum psychosis is a serious medical emergency. Many mothers will have a psychiatric assessment and, in most situations they will require hospitalization, until mothers are unable to hurt themselves or anyone else. longer a threat to themselves or others. This is where the nurse’s role comes in, it is extremely important for new parents, relatives and friends to be educated, aware as well to detect the signs and symptoms of postpartum depression and to be treated as soon as possible.^{3,6}

Although the exact reason for postpartum depression has still not been explained, there are many psychosocial, obstetrical and infant factors that have been related to be linked with it.⁷

Postpartum depression can have a negative effect on the mother’s quality of life, in the form of intimate relationship with her husband, the bond between the mother and her infant, infant attachment, child developmental outcomes from infancy across school age.⁸

Mothers with untreated PPD have a higher risk to disease and illnesses such as cardiovascular disease, stroke and type-2 diabetes both during maternal part of her lifetime as well as her entire life.⁹ Other studies showed that mothers with sever postpartum depression have a higher risk by 3.6 times to have diabetes and chronic disease than mother that are not depressed and are 1.4 times are more probable to have a stroke.^{10,11,12}

The effect of PPD on mothers can be seen in many different ways such as: personal suffering and causes a decline in the mothers' long-term psychological behaviors. Furthermore, postpartum depressed mothers display many difficulties motherhood and the burden of caring for the infant. As an effect of PPD the negative effects are that the mother is at a higher risk of having an unsatisfactory social relationship with her significant other and is not capable of caring for the infant social and emotional demands.¹³

Manifestations of PPD appears during the first 24 weeks after given birth, ordinarily the signs and symptoms of PPD occur approximately 14 days after giving birth. The mother's day to day performance and her mother-infant bond is altered due to this sickness. Therefore, PPD is recognized to be a systemic sickness.¹⁴

Infants who have mothers that are suffering with PPD have less chance of: being breastfeed, neglected health care, sleep practices and fail with obeying safety instructions with infant car seats and the fire alarm. Moreover, one of the negative effects of PPD is poor bonding between the mother and her newborn.¹⁵ However, the maternal infant bonding has a critical role in how the infants social, cognitive and behavioral development. Mothers with PPD do not responsive to the infants, have a decreased affection and attunement and also may show bad child care performances, which can lead to a decrease in the overall health of the infant.^{16,17}

PPD has a multi-factorial etiology. Several studies have considered the following as risk factors of PPD: **clinical:** premature delivery, intrauterine growth restriction, cesarean deliveries, and admission of infant to the neonatal care units, **biological:** sleep disturbance, deregulation of neurotransmitters, and serotonin, **hormonal:** thyroid, cortisol, and oxytocin, and **psychological variables:** stressful life events, marital discord, and low social support, attachment uncertainty, and personality descriptions.¹⁸

There are many other types of factors that cause depression in postpartum mothers.¹⁹ There is prior nonpuerperal depression, prior premenstrual dysphoria, stressful life events during pregnancy or immediate postpartum, poor social support, marital problems, abuse.²⁰ Little support from husband, personality conflict, low salary, immigration status, young aged mothers.²¹ Obstetrical stressors, and problematic infant temper as predictors of PPD.²² The evidence of PPD risk factors are diverse, such as undesired pregnancy²³ and sex of the infant²⁴ history of premenstrual syndrome.

The classified factors of PPD in to five main groups: physical/biological, psychological, obstetric/pediatric, socio-demographic, and cultural factors.²⁵

It is recommended in the initial prenatal visit, that every pregnant mother should give her history of mental disease and if there is a family history of mental disease. However, if the pregnant mothers have a history of depression, bipolar disorder or any kind of psychoses should be referred for psychiatric evaluation even though they are not showing present signs any symptoms. It is required for the mother to be monitored for a minimum of 3 months after child birth.²⁶

There are several treatment methods. It has been confirmed that both methods (non-pharmacologic and pharmacologic) has been in successful in the treating PPD. The non-pharmacologic treatment method of PPD includes the following: interpersonal psychotherapy, cognitive-behavioral therapy, family and marital group therapy, psychodynamic therapy, light therapy, peer-support therapy, and electroconvulsive therapy.²⁷

Aim of the study: To assess the prevalence and factors of postpartum depression among mothers at King Abdulaziz University Hospital

Material and Methods

Design: A quantitative descriptive cross sectional study.

Setting: This study was carried out in King Abdulaziz University Hospital in Jeddah (KAUH), the Kingdom of Saudi Arabia, in the outpatient clinics female waiting area that including Well-Baby Clinic and Obstetrics and Gynecology Clinic, the clinics started daily from Sunday to Thursday from 8 am up to 4 pm.

Subjects: The estimated sample size in selected area in the last three months from March 2018 to May 2018 were 160 women out of 292 by considering the following: The response distribution: 50 %. The margin of error: 5% and Confidence level: 95%. The calculated sample size was 160 women using Epi Info Statistical Program for sample size calculation.

Tools: Two tools were used in this study tool one: a structured, interview questionnaire was developed by the researcher consisted of four parts was used to collect data. Part I: women Socio-Demographic. Part II: Medical Surgical History, Part III: Reproductive History, Part IV: Life Style Habits and Experiences. Tool two: Edinburgh Postnatal Depression Scale (EPDS).

Methods: Official approval was obtained prior to the study. From ethical committee in Faculty of Nursing, King Abdulaziz University. From King Abdulaziz University Hospital. In this study, the reliability of the EPDS was freely optioned from the Royal College of Psychiatrists (1987). The Edinburgh Postnatal Depression Scale may be photocopied by individual researchers or clinicians for their own use without seeking permission from the publishers. After obtaining the ethical approval, data were obtained through out interviewing the women to get their socio demographic and reproductive history as well as the score of the Edinburgh Postnatal Depression Scale by using the study tools. In addition, filling the questioner for each participant took approximately 10-15 minutes. The researcher was the only one interviewing the participant to clarify any ambiguity. Collection of the data done during morning and afternoon time in the female waiting area of outpatient clinics. The data was collected in the period of waiting before seeing the physicians and some were taken after meeting with the physician. Categorical data was reported as frequency and percentage (%). Data was and analyzed using SPSS (version 21). Continuous data was reported as mean \pm SE. Differences in EPDS was analyzed using non-parametric Mann-Whitney or Kruskal-Wallis tests as the data was not normally distributed. The association between continuous age data and EPDS was analyzed using Spearman's correlation. A P <0.05 values (two-sided test) was accepted as statistically significant.

Result

Figure 1: Shows distribution of the participants according to the incidence of PPD.

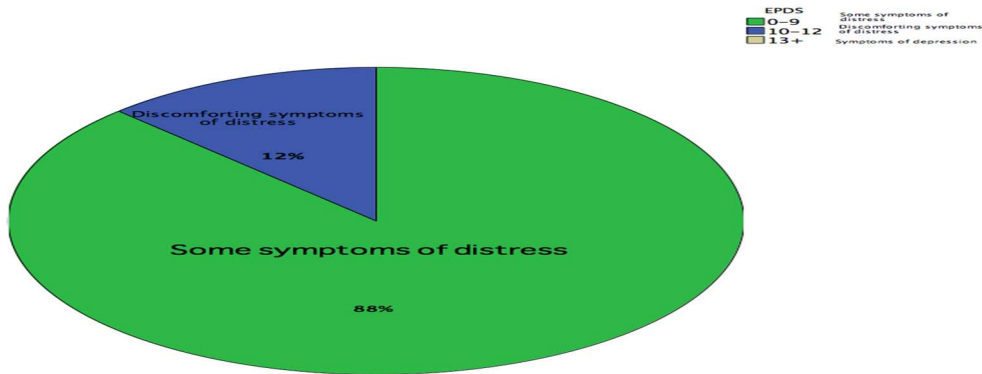


Table no 1 Illustrates correlation between socio-demographic characteristics of the participants with EPDS. Participants who have husbands living in another area had a significantly higher EPDS score compared with those who have husbands living in the same house (P=0.00). Also there was a statistical difference with the level of education of the participants and EPDS (P=0.067). While there was no statistical significant difference among the participants between EPDS and age (P=0.921), occupation (P=0.747), level of education (P=0.067) and family type (P=0.442).

Table no 1: Shows correlation between socio-demographic characteristics of the participants with EPDS

EPDS	n=146				n=146	%	P-value
	Mild		Moderate				
	n	%	n	%			
Age							0.921
<20	8	5.5%	1	0.7%	9	6.2%	
20-30	75	51.4%	11	7.5%	86	58.9%	
30+	45	30.8%	6	4.1%	51	34.9%	
Residency of mother and husband							0.00
Same house	126	86.3%	14	9.6%	140	95.9%	
Other	2	1.4%	4	2.7%	6	4.1%	
Level of education							0.067
Illiterate	2	1.4%	0	0.0%	2	1.4%	
Elementary/ intermediate	28	19.2%	8	5.5%	36	24.7%	
High school / University +	98	67.1%	10	6.8%	108	74.0%	
Occupation							0.747
House wife	95	65.1%	14	9.6%	109	74.7%	
Work/Student	33	22.6%	4	2.7%	37	25.3%	
Family type							0.442
Nuclear	96	65.8%	15	10.3%	111	76.0%	
Extended	32	21.9%	13	2.1%	35	24.0%	

Table no 2 Shows correlation between socio-demographic characteristics of the participants husband with EPDS. There was no statistical difference between husband's age ($P=0.355$), level of educational ($P=0.363$), occupation ($P=0.437$) or family income ($P=0.476$) on participants EPDS.

Table no 2: Shows correlation between socio-demographic characteristics of the participants husband with EPDS

EPDS	n=146				n=146	%	P-value
	Mild		Moderate				
	n	%	n	%			
Age							
<20	2	1.4%	0	0.0%	2	1.4%	0.355
20-30	40	27.4%	4	2.7%	44	30.1%	
30+	86	58.9%	14	9.6%	100	68.5%	
Level of education							
Illiterate	1	0.7%	1	0.7%	2	1.4%	0.363
Elementary/ intermediate	17	11.6%	0	0.0%	17	11.6%	
High school / University +	110	75.3%	17	11.6%	127	87.0%	
Occupation							
Unemployed	15	10.3%	1	0.7%	16	11.0%	0.437
Work/Student	113	77.4%	17	11.6%	130	89.0%	
Family Income							
Not enough	39	26.7%	4	2.7%	43	29.5%	0.476
Enough	89	61.0%	14	9.6%	103	70.5%	

Table no 3 Illustrates correlation between the participant's medical history and EPDS. Participants who have a medical history with heart disease had a significantly higher EPDS score compared those who do not have heart disease ($P=0.056$). Also, the participants with anemia had a significantly higher EPDS ($P=0.001$). While there was no statistical significant difference among the participant between medical history with EPDS and diabetes mellitus ($P=0.743$), hypertension ($P=0.636$) and other disease ($P=0.515$).

Table no 3: Shows correlation between the participant's medical history and EPDS

EPDS	n=146				n=146	%	P-value
	Mild		Moderate				
	n	%	n	%			
Do you have any disease?							
Yes	22	15.1%	8	5.5%	30	20.5%	0.007
No	106	72.6%	10	6.8%	116	79.5%	
Diabetes mellitus							
No	123	84.2%	17	11.6%	140	95.9%	0.743
Yes	5	3.4%	1	0.7%	6	4.1%	
Hypertension							
No	118	80.8%	16	11.0%	134	91.8%	0.636
Yes	10	6.8%	2	1.4%	12	8.2%	
Heart disease							
No	125	85.6%	16	11.0%	141	96.6%	0.056

Yes	3	2.1%	2	1.4%	5	3.4%	
Anemia							
No	126	86.3%	15	10.3%	141	96.6%	0.001
Yes	2	1.4%	3	2.1%	5	3.4%	
Other							
No	125	85.6%	18	12.3%	143	97.7%	0.515
Yes	3	2.1%	0	0.0%	3	2.1%	

Table no 4 Illustrates correlation between the participant's reproductive history and EPDS. Participants who had complications during antenatal/ delivery/ postpartum had a significantly higher EPDS score compared with those who did not have any complications ($P=0.004$). However, there was no statistical significant difference among the participants between EPDS and gravida ($P=0.200$), para ($P=0.165$), abortion ($P=0.147$), in vitro fertilization ($P=0.438$), mode of last delivery ($P=0.884$), delivery experience ($P=0.547$), if pregnancy was planned pregnancy ($P=0.808$) and response towards gender of the infant ($P=0.571$).

Table no 4: Shows correlation between the participant's reproductive history and EPDS

EPDS	n=146				n=146	%	P-value
	Mild		Moderate				
	n	%	n	%			
Gravida							
1	33	22.6%	2	1.4%	35	24.0%	0.200
2-3	63	43.2%	10	6.8%	73	50.0%	
4+	32	21.9%	6	4.1%	38	26.0%	
Para							
1	39	26.7%	3	2.1%	42	28.8%	0.165
2-3	61	41.8%	9	6.2%	70	47.9%	
4+	28	19.2%	6	4.1%	34	23.3%	
Abortions							
0	97	66.4%	10	6.8%	107	73.3%	0.147
1	20	13.7%	8	5.5%	28	19.2%	
2-3	11	7.5%	0	0.0%	11	7.5%	
Have you done in vitro fertilization?							
No	125	85.6%	17	11.6%	142	97.3%	0.438
Yes	3	2.1%	1	0.7%	4	2.7%	
Mode of last delivery?							
Vaginal	88	60.3%	12	8.2%	100	68.5%	0.884
Cesarean section	33	22.6%	5	3.4%	38	26.0%	
Instrumental	7	4.8%	1	0.7%	8	5.5%	
Delivery experience?							
Easy	57	39.0%	7	4.8%	64	43.8%	0.547
As expected	18	12.3%	2	1.4%	20	13.7%	
Difficult/ pain	53	36.3v	9	6.2%	62	42.5%	
Have you had any complications during antenatal/ delivery/ postpartum?							

No	75	51.4%	4	2.7%	79	54.1%	0.004
Yes	53	36.3%	14	9.6%	67	45.9%	
Was your last pregnancy a planned pregnancy?							
No	53	36.3%	8	5.5%	61	41.8%	0.808
Yes	75	51.4%	10	6.8%	85	58.2%	
What was your response towards gender of the infant?							
Desired	61	41.8%	5	3.4%	66	45.2%	0.571
Undesired	9	6.2%	6	4.1%	15	10.3%	
No difference	58	39.7%	7	4.8%	65	44.5%	

Table no 5 Shows correlation between the participant's life style, habits and experiences and EPDS. Participants who had a supportive relative (P=0.010) and participant who answered not applicable in receiving any treatment for depression symptoms (P=0.000) both had a significantly higher EPDS score compared with those who did not have a supportive relative and who did not received treatment. While, there was no statistical significant difference among the participants between EPDS and smoking (P=0.393), experiencing any physical/psychological violence (P=0.873), supportive husband (P=0.066), experienced a stressful life events (P=0.515), divorce (P=0.515) marital /family problem (P=0.168), work /school problem (P=0.267), personal/ family health problem (P=0.084), death of family member /close friend (P=0.743), change in living conditions (P=0.524). Meanwhile, there also was no statistical significant difference among the participants between EPDS and participants who experience any symptoms of depression before, little interest or loss of pleasure in doing things (P=0.267), feeling sad, depressed or hopeless (P=0.743), difficulty falling or staying asleep, or sleeping too much (P=0.515), feeling tired or having little energy (P=0.709), poor appetite or overeating (P=0.438) and difficulty concentrating on things, such as reading or watching television (P=0.515).

Table no 5: Shows correlation between the participant's life style, habits and experiences and EPDS

EPDS	n=146				n=146	%	P-value
	Mild		Moderate				
	n	%	n	%			
Do you smoke?							
No	112	76.7%	17	11.6%	129	88.4%	0.393
Yes	16	11.0%	1	0.7%	17	11.6%	
Have you experience any type of violence (physical/psychological)?							
No	122	83.6%	17	11.6%	139	95.2%	0.873
Yes	6	4.1%	1	0.7%	7	4.8%	
Does your husband support you at home/ baby care?							
No	49	33.6%	11	7.5%	60	41.1%	0.066
Yes	79	54.1%	7	4.8%	86	58.9%	
Do you have a supportive relative?							
No	45	30.8%	12	8.2%	57	39.0%	0.010
Yes	83	56.8%	6	4.1%	89	61.0%	
Have you experience any stressful life events in the last 3 months?							

Divorce							
No	125	85.6%	18	12.3%	143	97.9%	0.515
Yes	3	2.1%	0	0.0%	3	2.1%	
Marital /family problem							
No	109	74.7%	13	8.9%	122	83.6%	0.168
Yes	19	13.0%	5	3.4%	24	16.4%	
Work/ school problems							
No	126	86.3%	17	11.6%	143	97.9%	0.267
Yes	2	1.4%	1	0.7%	3	2.1%	
Personal / family health problems							
No	107	73.3%	12	8.2%	119	81.5%	0.084
Yes	21	14.4%	6	4.1%	27	18.5%	
Death of a family member / close friend							
No	123	84.2%	17	11.6%	140	95.9%	0.743
Yes	5	3.4%	1	0.7%	6	4.1%	
Change in living conditions							
No	101	69.2%	13	8.9%	114	78.1%	0.524
Yes	27	18.5%	5	3.4%	32	21.9%	
Did you experience any of these symptoms before?							
Little interest or loss of pleasure in doing things?							
No	126	86.3%	17	11.6%	143	97.9%	0.267
Yes	2	1.4%	1	0.7%	3	2.1%	
Feeling sad, depressed or hopeless							
No	123	84.2%	17	11.6%	140	95.9%	0.743
Yes	5	3.4%	1	0.7%	6	4.1%	
Difficulty falling or staying asleep, or sleeping too much?							
No	125	85.6%	18	12.3%	143	97.9%	0.515
Yes	3	2.1%	0	0.0%	3	2.1%	
Feeling tired or having little energy							
No	127	87.0%	18	12.3%	145	99.3%	0.709
Yes	1	0.7%	0	0.0%	1	0.7%	
Poor appetite or overeating							
No	125	85.6%	17	11.6%	142	97.3%	0.438
Yes	3	2.1%	1	0.7%	4	2.7%	
Difficulty concentrating on things, such as reading or watching television?							
No	125	85.6%	18	12.3%	143	97.9%	0.515
Yes	3	2.1%	0	0.0%	3	2.1%	
Have you received any treatment for these symptoms?							
No	31	21.2%	18	12.3%	49	33.6%	0.000
N/A	97	66.4%	0	0.0%	97	66.4%	

Discussion

In the current study it was found that the majority of the postpartum women had some symptoms of distress that may be short-lived and are less likely to interfere with day to day ability to function at home or at work. However, if these symptoms have persisted more than a week or two further enquiry is warranted (mild depression).

This result is in line with Alasoom & Koura (2014),²⁸ they recommended to screen high-risk mothers for PPD during primary care well-baby appointments and to refer the identified cases to the public mental health centers for primary management and prevention of psychosocial injury of the family.

The finding of this study is comparable with a study done in United Arab Emirates by Hamdan & Tamim (2011)²⁹ revealed that 83.2% of the participants at two months postpartum had mild depressive symptoms. Furthermore, this study is in line with a study conducted in Jeddah Saudi Arabia in (2015) the results showed that 76.1% of the participants had mild depressive symptoms (Almarzouki, Alzaben, Sawan & Filimban, 2015).³⁰ This might be due to use of similar study design, study sample and same Middle Eastern cultural beliefs.

On the other hand, the incidence of mild PPD in this study is higher as compared to study conducted in the USA (Qobadi, Collier & Zhang, 2016),³¹ in Canada (McDonald et al., 2012).³² This might be due to the difference in study design, the time of evaluation and the large sample size. The study conducted in USA, used Mississippi Pregnancy Risk Assessment Monitoring System (PRAMS), whereas our study design was an ongoing longitudinal cohort study cross-sectional. Additionally, there is a variation in the time of the evaluation the study in USA included studies published from the year 2009 up to 2011. The study in Canada was in the year of 2016. Both studies had a large sample size of between 1500 up to 3700 participants. Women show signs of depression in the first week of postpartum, they showed be followed up for a longer period by nurses and midwives.

Meanwhile, the findings of the present study revealed that 12% of the postpartum women had indicates, the presence of symptoms of distress that may be discomforting. Repeat the EPDS in 2 weeks time and continue monitoring progress regularly. If the scores increase to above 12 assess further and consider referral as needed (moderate depression).

This result is in line with McCabe-Beane, Segre, Perkhounkova, Stuart & O'Hara (2016),³³ they recommended for upcoming studies to create a severity range on the EPDS using postnatal participants and should uses clinical questionnaires to advance additional precise severity range on the EPDS to notify future suggestions for severity categories. Every part of these strengths would help to improve the identification and treatment for postnatal depressed mothers. Which could help in prevention further complications of the maternal well-being, the quality of her life, also the mothers bounding with her new infant as well as if she has other children and her intimate relationship with her husband. It can also have a negative effect on the infant cognitive, behavior and social outcome.

This result is not in line with that of Anokye, Acheampong, Budu-Ainooson, Obeng & Akwasi, (2018),³⁴ who studied the prevalence, intervention and treatment of PPD in Ghana. They found that a small proportion of the study sample had moderate depression. This difference could be due to the difference in the study culture and different screening tool.

The findings of the present study revealed that none of the postpartum women suffer from severe depression. If participants score above 12 on the EPDS, they require further assessment and appropriate management as the likelihood of depression is high. Referral to a psychiatrist/ psychologist may be necessary.

The results of the current study are also incongruent with Al Hinai & Al Hinai (2014),³⁵ who carried out a study titled “Prospective Study on Prevalence and Risk Factors of Postpartum Depression in Al-Dakhlyia Governorate in Oman” and found that severe PPD among Omani women was 13.5% at weeks and 10.6% at eight weeks.

The current study showed that residency of mother and husband, a history of heart disease, anemia, complications during antenatal, delivery and postpartum period, a supportive relative and if received treatment for depressive symptoms were significantly associated with PPD.

Like in many other Arab and Islamic cultures, women in Saudi Arabia are very valued by their extended families. So, the results of the current study found that there is a statistical significant difference between incidence of PPD and residency of the mother and husband. As the incidence was higher among women not living with the husband. Similarity, as reported by other studies e.g., Patel et al. (2015),³⁶ living in a nuclear family decreases the chances of developing PPD by 11.11 times compared to women living in an extended family. Living together decreases the odds for the women to develop PPD.

Result of the present study have shown that women who live with their husbands demonstrate lower levels of PPD. In line with these findings, the physical presence of a husband provides women with a sense of security and assurance (Montgomery, 2016).³⁷ Additionally, women’s perceptions of their presence husbands were strong predictors of PPD. During pregnancy, the husband’s support is a strong factor that affects postnatal experiences (Stuart, 2012).³⁸ This effect can continue with the same pattern of behaviour through to the postpartum period and cause stressful life events. However, the current study did not find a significant effect of stressful life events (marital problems) and PPD. Husbands’ involvement that included supporting their wives both during and after the pregnancy through their difficult circumstances (e.g., destabilization and negative feelings) was associated with significantly lower levels of PPD. Specifically, the availability of the husband enables him to be supportive in verbalizing positive thoughts and giving feedback on the wife’s performance as a mother (Whiffen, Kallos-Lilly & MacDonald, 2001).³⁹ This is a source of validation that is critical in contributing to the wife’s self-esteem which as a result helps reduce PPD symptoms (Henderson, 2001).⁴⁰

However, the present study did not show a statistical significant relationship between the husband’s support and PPD scores. Instead, the results found that the support from relatives was highly related to the symptoms of PPD. These results are consistent with a study conducted by Chang et al. (2013),⁴¹ who identified absence family support as a silent risk factor of PDD, as shown by mothers of premature and full-term infants who had significantly lower levels of PPD with increased social support. In Muslim countries, after child birth, mothers move to their parents’ house for 40 days to recover. This helps the mothers transition into their new role and provides family support which decreases stress and as a result reduces PPD symptoms (Al-Hinai & Al-Hinai, 2014).³⁵ Women who had support from relatives showed reductions in reported symptomatology (Hung, 2005).⁴² Therefore, family and social support is a protective factor against the risk of PPD.

The result of the present study found a statistical significant relationship between anemia and PPD, this is supported by a study done in Saudi Arabia by Alharbi and Abdulghani (2014),⁴³ who found, that there was a statistical significant relationship between anemia during prenatal and postpartum Hemoglobin levels and between decreased hemoglobin levels and risk of PPD signs. Consequently, women who have lower levels of hemoglobin had a higher score on the EPDS.

The finding of this study is also comparable with a study done in Iran by Goshtasebi et al. (2013),⁴⁴ who found that, 14% of the participants had a hemoglobin level lower than 11 g/dL. This indicates that there is an association between anemia and PPD. Anemia during the postpartum period has been found to cause women to feel weak, fatigued and tired as their immunity decreases with difficulties concentrating

(Breymann, 2002).⁴⁵ In line with these findings, Beard et al. (2005)⁴⁶ found that women who had iron supplements for their anemia at 9 months following the delivery experienced improvements in both their emotional and cognitive abilities compared to those who consumed a placebo supplement. This suggests that the complications that are associated with anemia may contribute to the experience of elevated symptoms of PPD.

On the other hand, this study is not in agreement with the study done in Canada by Chandrasekaran et al. (2018),⁴⁷ and showed that there was no statistical significant relationship between anemia or iron deficiency and PPD. However, this study could have been affected by factors that include the selection of women who had Cesarean sections and were receiving treatment for their anemia.

Depression and cardiovascular disease have been found to be highly comorbid (Mastrogiannis et al., 2012).⁴⁸ The result of the current study has identified a clear link between heart disease and PPD. Higher PPD scores were associated with presence of heart disease. This could be due to the pre and post pregnancy complications that occur as a result of heart disease. Such that women with heart disease are more susceptible to obstetric morbidity that is associated with post-partum haemorrhage, that includes excessive bleeding at delivery (Cauldewell et al., 2016).⁴⁹ Indeed, women who experience early depressive symptoms during the perinatal period are at higher risks of developing cardiovascular diseases (Neubauer et al., 2013).⁵⁰ Those with cardiovascular disease are highly vulnerable to preeclampsia that causes complications during pregnancy. Furthermore, previous studies have shown that during the postpartum period, preeclampsia is a strong predictor that is associated with increased risks of depression (Blom et al., 2010; Palmsten et al., 2012).^{51, 52} Specifically, cardiovascular disease and preeclampsia are positively correlated with postpartum depression (Neubauer et al., 2013).⁵⁰ This could be caused by a combination of biological and stressful difficulties associated with the comorbidity of both depression and cardiovascular disease (Hoedjes et al. 2011).⁵³

The results of the present study have shown that women with complications during antenatal, delivery and postpartum period have a higher score of PPD. In line with these findings, women with more than two antenatal complication have a great possibility of developing PPD. There is a relationship between antenatal psychosocial wellbeing and the sociodemographic characteristics of the women. Additionally, the study also showed that pre-eclampsia, bad delivery experience, unplanned C/S, fetal distress and hospitalization are leading causes to PPD (Blom et al., 2010).⁵¹ However, the current study found to have a statistical significant relationship between PPD and complications during antenatal, delivery and postpartum period. This could be due to the changes in the woman's hormones, stress, exhaustion and pain.

Conclusion and recommendation

Postpartum depression usually begins around the 4 week following child birth; however, it may begin at any time during the first 12 months after delivery. Risk factors for postpartum depression include: low level of education, lack of partner or relative support, infant health problems, history of abortion, gender of infant, medical or surgical history, life stressor event, and changes in the living conditions.

Based on the findings of the present study, the following recommendations are suggested:

1. Postpartum depression usually begins around the 4 week following child birth; however, it may begin at any time during the first 12 months after delivery. Risk factors for postpartum depression include: low level of education, lack of partner or relative support, infant health problems, history of abortion, gender of infant, medical or surgical history, life stressor event, and changes in the living conditions. Provide the required and proper training to the maternity nurses and midwives on postpartum

- depression to be able to timely recognize the symptoms of PPD and make appropriate referral.
2. Assess the different healthcare provider's knowledge and awareness towards the symptoms of postpartum depression.
 3. Explore the strategies of hospitals regarding the care during postpartum period and enforce about the importance of early PPD detection.
 4. Conduct continues nurses' educational programs and workshops related to postpartum depression and maternity nurses and midwife's role in hospitals and primary health care centers setting.

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