A Prospective Observational Study to Find out the Characteristics of Postpartum Depression (PPD) and to Assess the Impact of Pharmacist Led Counselling among the Females with PPD

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ABSTRACT

Objectives: The study aimed to identify patterns of postpartum depression prevalence, risk factors and to assess the impact of pharmacist-led counselling among depressed postnatal. **Methods:** This was a Prospective Observational study conducted with a sample of 120 women. PPD screening was done using DASS-21 (Depression, Anxiety and Stress Scale) and EPDS (Edinburgh Postnatal Depression) questionnaires on the 1st day postpartum, and even on the 2nd and 4th week postnatal. The depressed women were given interventional treatment for supportive counselling. **Results:** The prevalence rate of PPD using EPDS was 34.17% on 1st day postpartum, 37.5%, and 4.16% on the 2nd and 4th week postpartum respectively. Similarly, using DASS-21 it was found 21.67%, 15.83%, and 2.5%. The associated risk factors were women's age (<30), lower education, number of child (>2), more than one girl children, Adverse life related events, and low level or lack of support from partner and In-laws. DASS-21 scale was useful screening tool than the EPDS scale.

After providing counselling the number of depressed women decreased. **Conclusion:** High prevalence rate of PPD was found in which socio-cultural factors play a major role. Sometimes anxiety and stress co-exist with depression, thus it is postnatal distress that should be aimed for and for which an efficient screening tool should be used.

Keywords: Postpartum depression/Postnatal depression, Prevalence, Risk-factors, EPDS scale, DASS-21 scale.

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INTRODUCTION

Pregnancy and postpartum are observed as high-risk periods for the development of psychiatric disorders.[1] Postpartum depression is a serious health issue for many women from various cultures.[2] According to The American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM), PPD is defined as a major depressive episode with postpartum onset and elaborates, If the onset of mood symptoms arises during pregnancy or in the 4 weeks following delivery. However, in clinical practice and clinical research, PPD is defined as the symptoms occurring from 4 weeks to 1 year after childbirth.[3] The global prevalence rate of PPD is 17%.[4] Its prevalence in the western side of the world is around 10–15%, but higher rates have been reported in developing countries like India.[5] PPD not only affects the mother but also impairs the cognitive, behavioural, social-emotional, and physical development of the child. Despite its serious type of consequences, it is a highly neglected area of maternal healthcare in developing countries.[6] The symptoms of PPD are sadness, decrease energy, alteration in sleeping and eating patterns, lower desire for sex, crying, and anxiety.[7] Postnatal depression should be treated using methods related to those used for non-postpartum major depressive disorder. These include - (1) patient education related to depression, alternative treatment, about antidepressant drugs, duration of treatment, healthy lifestyle, and social support (2) the selection of an active treatment technique (antidepressant medication or psychotherapy) through shared decision making process between the patient and principle investigator.[8] We have observed that very few studies have been carried out on this topic in the Gujarat state of India with no combined study on the prevalence of PPD, risk factors along with supportive care counselling for PPD. While the majority of

the studies have included EPDS (Edinburgh Postnatal Depression) as the validated screening tool for PPD, however, postpartum women not only experience depressive symptoms but anxiety and stress as well. Thus DASS-21 (Depression, Anxiety and Stress Scale) was used combined with EPDS to find out better screening tools.

METHODS

It was a prospective observational study conducted for 6 months in the Department of Gynecology at Dhiraj General Hospital, Sumandeep Vidyapeeth Deemed to be University, Vadodara, Gujarat (India). The study was initiated after getting the approval from Sumandeep Vidyapeeth Institutional Ethics Committee. (SVIEC NO: SVIEC/ON/ Phar/BNPG18/D19034). Based on previous clinical studies and using the purposive sampling method, the sample size calculated for the study was 120. All the healthy postnatal women fulfilling the criteria (No prior hormonal therapy/ no general medical illness or neurological condition/ Non-alcoholic or not on any substance use or dependence (excluding nicotine) were included after taking the consent. The patient's medical records were checked and information such as socio-demographics, antenatal, medical, and other relevant history was noted. Women were screened for PPD using EPDS and DASS-21 scales questionnaires during the first, second, and fourth weeks of postpartum. The questionnaires were filled out by the interviewers according to the answers provided by the participants, and then the scores were calculated accordingly. Women who scored >8 on EPDS and >9 on DASS-21 in any of the postnatal weeks were considered to have PPD and thus were given

interventional treatment for supportive counselling by interviewers. All the gathered data were further analyzed to find out the prevalence and the association of various risk factors was determined by odds-ratio and significant association was accepted at <5% level of error using Chi-square or Fisher's exact tests. Graphical representation was used for a better understanding of data and a p-value of ≤ 0.05 was considered as significant.

RESULTS

Out of 120 women included in the analysis, the mean age was 24.39. The prevalence rate of PPD was found to be 34.17% (N=41) on 1st day postpartum, 37.5% (*n*=45), and 4.16% (*n*=5) on the 2nd and 4th week postpartum respectively when identified using EPDS scale. Similarly using DASS-21, the prevalence was 21.67% (*n*=26), 15.83% (*n*=19), and 2.5% (*n*=3) on the first day, 2nd week, and 4th week of post-partum respectively. On comparing the socio-demographic risk factors using EPDS among the female participants with depression and without depression, it was observed that PPD is significantly associated with a lower level of education (up to primary level). These data gave a *p*-value <0.05 (at a chi-square value of 3.70). Similarly, unemployment was the significant risk factor for the development of PPD, p-value (at chi-square value of 3.81). In DASS-21, only the women with age <30 years were found to have developed PPD symptoms with a *p*-value <0.05 (at chi-square value of 5.51) (Table 1). In our study, on comparing the significance of having a greater number of children in causing PPD. The data gave a *p*-value <0.05 (at chi-square value of 4.01), indicating that more than 2 children were the significant risk factor for the development of PPD. This was found while using both scales. Other gender issues and obstetric factors that were found significantly associated with developing PPD while screening using the DASS-21 scale were more than one girl children and pressure of delivering a male child (Table 2). The risk of PPD was more in the women who suffered from any adverse event in life and thus considered as the contributing factor for depression. These data gave a *p*-value <0.05 (at chi-square value of 7.15). Similarly, not getting support from the partner and In-laws was significantly associated with PPD. These data gave a *p*-value <0.05 (at chi-square value of 4.02 and 4.10), showing the significance. However, not receiving support from parents was not associated with PPD in our study (Table 3).

Comparison of EPDS and DASS-21 scales

Figure 1 represents the clinical pathway, in which *n*=41(34.2%) women were found to be likely depressed (On EPDS). These women were assessed further and *n*=20 (48.7%) was classified as depressed and the remaining *n*=21 (51.2%) was not (On DASS-21). This shows that the remaining 21 women identified as depressed on EPDS did not co-relate with the DASS-21 scale, in which 13 were anxious, 5 were stressed and 3 women received no classification. This indicates that despite having a sensitive EPDS cut-off of >8, 6 depressed women were not identified by EPDS as likely to be depressed. Figure 2 represents that out of 120 participants 98 women were postnatally distressed in addition to which 72 women (49 anxious and 23 stressed) over and above 26 depressed women in the total sample. Thus, if depression would be considered then 72 women would have been missed while screening for depression alone. Similarly returning to EPDS (Figure 1), in which 21 women out of 41 were not found to be depressed. Out of these 21 women, 18 women (anxious and stressed) were not corroborated by DASS-21 as being depressed which resulted in no further assessment. Thus, if depression would be considered then 72 women would have been missed while screening for depression alone. Similarly returning to EPDS (Figure 1), in which 21 women out of 41 were not found to be depressed. Out of these 21 women,

18 women (anxious and stressed) were not corroborated by DASS-21 as being depressed which resulted in no further assessment.

Effect of Counselling on Patients

On the EPDS scale, 41 women who were identified as depressed women on the first day postpartum were provided supportive counselling as the treatment option. Out of these 41 depressed women, 18 of them improved when assessed in the 2nd week postpartum and the remaining 23 were still found to be depressed. Again these 23 women were counselled, out of which 20 women showed improvement in the 4th week while the remaining 3 were not assessed further. Similarly, 26 out of 120 participants were identified as depressed by the DASS-21 scale who were provided supportive counselling on 1st day postpartum. Out of which, 11 women improved in the 2nd week postnatal while the remaining 15 were still depressed and was again counselled. In the 4th week, the post-partum majority of the women improved with no depression (*n*=14) while only 1 woman was found to be depressed. Thus, a significant fall in depression was observed after providing supportive counselling to the depressed participants.

DISCUSSION

This study was conducted on healthy mothers without any prior history of psychiatric illness and also those who gave birth to a healthy infant. Thus, providing insights about the specific group of mothers which were usually neglected in most other studies.[5] The prevalence rate of PPD in our study was 34.17% (*n*=41) on 1st day postpartum, 37.5% (*n*=45), and 4.16% (*n*=5) on the 2nd and 4th week postpartum respectively when identified using the EPDS scale. Similarly, DASS-21 scale identified 21.67% (*n*=26), 15.83% (*n*=19) and 2.5% (*n*=3). This is similar to the observation mentioned in the study.[5] However, the pooled prevalence rate of PPD in India according to the systemic review and metaanalysis was 22%.[9] The reason for the overestimation of prevalence in our study using EPDS as a screening tool was because of considering lower cut-off score (>8). Thus, a wide range of variations in the prevalence of PPD has been observed in different studies, using different methods of assessment, varied geographical locations, different duration for study, and also a total number of the subjects involved.[10]

Lower level of education was found to be a significant risk factor that led to PPD in our study. This is because education permits greater choices in life decisions and influences aspirations, self-image, and opportunities to acquire knowledge, which may motivate attitudes and behaviour toward lifestyle and health status and the results were similar with a study.[11] Younger women i.e., age <30 years were significantly more prone to developing depressive symptoms in our study. This may be due to early marriage in our community and so the women might not be prepared to carry a child along with the other responsibilities or have less understanding of such situation similarly observed in a study.[12] Evidence was scarce about postpartum mental health and unemployment in low-income countries. However, many present studies did not show that unemployment can lead to PPD rather PPD was observed in employed mothers.[13] However, findings in our study proved to have a significant association similar to a study.[14] This is because the mother has to be dependent on others which increases the financial burden to raising children. Our study showed no significant association with the other socioeconomic risk factors like- family structure (joint/nuclear), owns the land, type of house (kaccha/pakka) which were similar to the results from the study,[15] except the low SES which was found to be significant in that study and not in ours.

In our study, the significance of developing PPD was found in the women having >2 children, women with >1 female child, and the pressure on the women for having a male child. This is because more children increase

Table 1: Comparison of socio-demographic risk factors according to EPDS and DASS-21.

| RISK FACTORS	EPDS						DASS-21					
	1st DAY			2nd WEEK			1st DAY			2nd WEEK		
	With depression n=41 (34.17%)	Without depression n=79 (65.83%)	p-value	With Depression n=45 (37.5%)	Without depression n=75 (62.5%)	p-value	With depression n=26 (21.67%)	Without depression n=94 (78.33%)	p-value	With Depression n=19 (15.83%)	Without depression n=101 (84.16%)	p-value
Age												
20-30	39 (95.12)	74 (93.67)	0.75	43 (35.56)	70 (93.33)	0.62	22 (84.62)	91 (96.81)	0.01*	17 (89.47)	96 (95.05)	0.34
>30	2 (4.88)	5 (6.33)		2 (4.44)	5 (6.67)		4 (15.38)	3 (3.19)		2 (10.53)	5 (4.95)	
Education												
< OR EQUAL TO PRIMARY	15 (36.59)	45 (56.96)	0.03*	25 (55.56)	35 (46.67)	0.35	10 (38.46)	50 (53.19)	0.27	8 (42.11)	52 (51.49)	0.50
> PRIMARY	26 (63.41)	34 (43.04)		20 (44.44)	40 (53.33)		16 (61.54)	44 (46.81)		11 (57.89)	51 (50.50)	
Occuppation												
UNEMPLOYED	29 (70.73)	58 (73.42)	0.75	28 (62.22)	59 (78.67)	0.04*	17 (65.38)	70 (74.47)	0.36	13 (68.42)	74 (73.27)	0.66
OTHERS	12 (29.27)	21 (26.58)		17 (37.78)	16 (21.33)		9 (34.62)	24 (25.53)		6 (31.58)	27 (26.73)	
Family Structure												
NUCLEAR	20 (48.78)	30 (37.97)	0.25	20 (44.44)	30 (40)	0.63	6 (23.08)	44 (46.81)	0.30	5 (26.32)	45 (44.55)	0.14
JOINT	21 (51.22)	49 (62.03)		25 (55.56)	45 (60)		20 (76.32)	50 (53.19)		14 (73.68)	56 (55.45)	
Owns Land												
YES	19 (46.34)	48 (60.76)	0.13	24 (53.55)	43 (57.33)	0.67	17 (65.38)	50 (53.19)	0.27	14 (73.68)	55 (54.46)	0.12
NO	22 (53.66)	31 (39.24)		21 (46.67)	32 (42.67)		9 (34.62)	44 (46.81)		5 (26.32)	46 (45.54)	
Type of House												
KACCHA	26 (63.41)	54 (68.35)	0.59	27 (60)	48 (64)	0.66	14 (53.85)	64 (68.09)	0.09	12 (63.16)	55 (54.46)	0.48
PAKKA	15 (36.59)	25 (31.65)		18 (40)	27 (36)		12 (46.15)	30 (31.91)		7 (36.84)	46 (45.54)	
Socio-Economic Status												
LOWER/UPPER-LOWER	37 (90.24)	72 (91.14)	0.87	40 (88.89)	69 (92)	0.57	22 (84.62)	87 (92.55)	0.21	18 (94.74)	91 (90.10)	0.52
UPPER	4(3.76)	7 (8.86)		5 (11.11)	6 (8)		4 (15.38)	7 (7.75)		1 (5.26)	10 (9.90)	
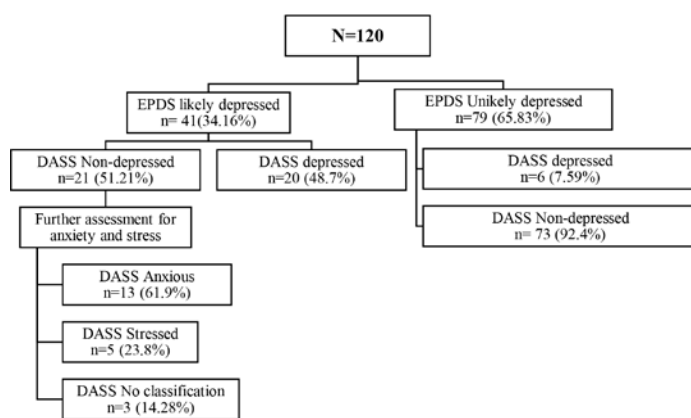
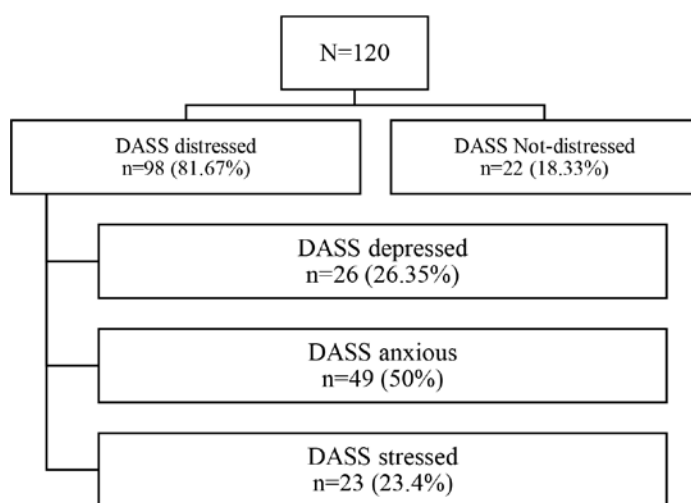**Figure 1:** DASS-21 classification for the women identified as depressed on EPDS.

Figure 2: Classification of women on DASS-21 (depression, anxiety, stress).

more responsibilities and financial burden on the families, especially on the parents that belong to low SES like most of our study population which eventually leads to stress to mothers and even at fathers also. Also, Indian families still gave the preference of having a male child because of the belief of continuing the family lineage and would even stay with the parents whereas, the girl goes to her husband's house. Therefore, the birth of the female child is considered a family and social stressor in Indian society and is strongly associated with the development of PPD. Similar results were observed in studies.[9,15-16]

In our study, we found the association between adverse life events leading to the development of previous abortion, previous child's death, domestic violence, husband's addiction to alcohol, and parent's death. Another risk factor that was found to be associated with PPD in our study was the lack of support from the husband and In-laws. This is because adverse event leads to fear, stress or anxiety in the women which brings emotional imbalance. Substance abuse by the husband will deprive women of getting financial or emotional support from the father during pregnancy, delivery, or even postpartum and thus increase the risk for PPD. Similarly, the In-laws who do not provide support due to various reasons have shown significantly associated with PPD. Similar results were observed in a couple of studies.[12,14] The additional stress imparted by domestic violence probably explains the increased incidence of PPD.

Western research has implicated spousal and parental relationships as risk factors for postpartum depression in one study.[17]

In our study, we tried to compare the DASS-21 scale and EPDS scale, to find the better tool for screening of PPD. Initially, on doing DASS-21 classification for the women identified as depressed on EPDS in our study population (*n*=120), 41 women were found depressed on the EPDS scale but out of which only 20 women were proved to be depressed on DASS-21. Thus, the remaining 21 women did not correlate with EPDS but when further classified it with DASS-21- 13 were anxious, 5 were stressed and 3 women received no classification but also were not further investigated. Thus, EPDS leads to the overestimation of the prevalence of PPD. Further out of non-depressed women (*n*=79) identified by EPDS, 6 women were still found to be depressed when screened using DASS-21. Thus, here EPDS failed to identify these 6 women which eventually won't even be further investigated, and therefore the condition of the women might get worse for not receiving the proper intervention. Similar results were found in the study[18] which even states the importance of assessing postnatal women for broader indicators of psychological morbidity (anxiety and stress) than that of depression alone and this DASS-21 appears to be a useful tool. Thus, for assessing broader concepts, we investigated the prevalence of depression, anxiety, and stress for the total sample using DASS-21. 120 participants 98 women were found to be postnatally distressed in addition to which 72 women (49 anxious and 23 stressed) over and above 26 depressed women in the total sample. Also, if depression would only be the criteria, then these 72 women would receive no interventional support. Thus, the women were more anxious and stressed rather than depressed since socio-demographic plays an important role in our Indian culture. However, 21 questions could be quite tedious at times to carry out an interview, especially in the population who do not understand the importance of it and don't provide adequate answers and therefore the validity may be questionable. For a situation like this, EPDS can prove to be better for a screening tool for PPD as it is less time-consuming. But again, it is not confirmatory as suggested in the study.[1] The study highlights the significant decrease in the number of depressed women after providing supportive counselling over the period within 4 weeks. Our observations were similar to the study[19] who concluded that psychosocial support had been the most effective intervention in PPD management. Clinical pharmacists are experts in modern medicines and whose work is even to provide patient counselling and as frontline health providers, they are highly trusted and trained healthcare professionals playing a critical role in patient care and public health. Providing proper training to them can make a great deal of impact and can improve maternal health to a great extent. Similar suggestions have been listed in various studies which highlighted the importance of training para-professionals to provide needed support for postpartum mothers. Studies suggest that a separate department of counselling should be made and counsellors should be appointed for the same.[14,20-21]

CONCLUSION

A high prevalence of PPD was found in our study. However, the prevalence of PPD varied in different studies carried out in different regions using various screening tools. Different predisposing factors like socio-Demographic factors which include women's age (<30), low level of education, obstetric factors gender-related issues like several children (>2), more than one girl child, Adverse life events like previous abortion, previous child's death, domestic violence, husband's addiction to alcohol and parent's death and other risk factors like lack of partner and In-laws support were associated for the development of PPD and were addressed by counselling of pregnant subjects and their families. However, since socio-cultural factors play a major role in the

Table 2: Comparison of obstetric risk factors and gender issues according to EPDS and DASS-21.

RISK FACTORS	EPDS						DASS-21					
	1st DAY			2nd WEEK			1st Day			2nd Week		
	With depression N=41 (34.17%)	Without depression N=79 (65.83%)	p-value	With Depression N=45 (37.5%)	Without depression N=75 (62.5%)	p-value	With depression N=26 (21.67%)	Without depression N=94 (78.33%)	p-value	With Depression N-19 (15.83%)	Without depression N=101 (84.16%)	p-value
TOTAL NO OF CHILDREN												
>2	9 (21.95)	10 (12.66)	0.19	11 (24.44)	8 (10.67)	0.04*	7 (26.92)	12 (12.77)	0.08	6 (31.58)	13 (12.87)	0.04*
< OR EQUAL TO 2	32 (78.05)	69 (87.34)		34 (75.56)	67 (89.33)		19 (73.08)	82 (87.23)		13 (68.42)	88 (87.13)	
TOTAL NO OF GIRLS												
>1	13 (31.71)	15 (18.99)	1.18	13 (28.89)	15 (20.00)	0.27	12 (46.15)	16 (17.02)	0.01*	9 (47.37)	19 (18.81)	0.01*
< OR EQUAL TO 1	28 (68.29)	64 (81.01)		32 (71.11)	60 (80.00)		14 (53.85)	78 (82.98)		10 (52.63)	82 (81.19)	
TOTAL NO OF BOYS												
>1	7 (17.07)	19 (24.05)	0.38	10 (22.22)	16 (21.33)	0.91	5 (19.23)	21 (22.34)	0.73	5 (26.32)	21 (20.79)	0.59
< OR EQUAL TO 1	34 (82.93)	60 (75.95)		35 (77.78)	59 (78.67)		21 (80.77)	73 (77.66)		14 (73.68)	80 (79.21)	
PRESENT PREGNANCY												
WANTED	34 (82.93)	71 (89.87)	0.28	39 (86.67)	66 (88.00)	0.83	22 (84.82)	83 (88.30)	0.62	18 (94.74)	87 (86.14)	0.30
UNWANTED	7 (17.07)	8 (10.13)		6 (13.33)	9 (12.00)		4 (15.38)	11 (11.70)		1 (5.26)	14 (13.86)	
IF WANTED, PREGNANCY												
PLANNED	23 (56.10)	56 (70.89)	0.21	27 (60)	52 (69.33)	0.27	14 (63.64)	65 (87.31)	0.16	12 (66.67)	67 (77.01)	0.35
UNPLANNED	11 (26.83)	15 (18.99)		12 (26.67)	14 (18.67)		8 (36.36)	18 (21.69)		6 (33.33)	20 (22.99)	
FEAR OF GENDER												
NO	30 (73.17)	55 (69.62)	0.68	30 (66.67)	54 (72.97)	0.51	18 (69.23)	67 (71.28)	0.84	13 (68.42)	72 (71.29)	0.80
YES	11 (26.83)	24 (30.38)		15 (33.33)	21 (28)		8 (30.77)	27 (28.72)		6 (31.58)	29 (28.71)	
PRESSURE OF MALE CHILD												
YES	14 (34.15)	26 (32.91)	0.89	16 (35.56)	24 (32)	0.69	14 (63.64)	26 (27.66)	0.01*	11 (57.89)	29 (28.71)	0.01*
NO	27 (65.85)	53 (67.09)		29 (64.44)	51 (68)		12 (46.15)	68 (72.34)		8 (42.11)	72 (71.29)	
MODE OF DELIVERY												
C-SECTION	22 (53.66)	33 (41.77)	0.22	20 (44.44)	35 (46.67)	0.81	15 (57.69)	40 (42.55)	0.17	11 (57.89)	44 (43.56)	0.25
NORMAL	19 (46.34)	46 (58.23)		25 (55.56)	40 (53.33)		11 (42.31)	54 (57.45)		8 (42.11)	57 (56.44)	
COMPLICATION DURING PREGNANCY OR DELIVERY												
YES	5 (12.20)	9 (11.39)	0.90	8 (17.78)	6 (8)	0.11	2 (7.69)	12 (12.77)	0.48	1 (5.26)	13 (12.87)	0.34
NO	36 (87.80)	70 (88.61)		37 (82.22)	69 (92)		24 (92.31)	82 (87.23)		18 (94.74)	88 (87.13)	
COMPLICATION DURING PREVIOUS PREGNANCY OR DELIVERY												
YES	1 (2.44)	7 (8.86)	0.18	2 (4.44)	6 (8)	0.45	1 (3.85)	8 (8.52)	0.42	1 (5.26)	8 (7.92)	0.69
NO	40 (97.56)	72 (91.14)		43 (95.56)	69 (92)		25 (96.15)	86 (91.49)		18 (94.74)	93 (92.08)	

Table 3: Comparison of adverse events and supporting factors according to EPDS and DASS-21.

RISK FACTORS	EPDS						DASS-21					
	1st DAY			2nd WEEK			1st DAY			2nd WEEK		
	With depression n=41 (34.17%)	Without depression n=79 (65.83%)	p-value	With Depression n=45 (37.5%)	Without depression n=75 (62.5%)	p-value	With depression n=26 (21.67%)	Without depression n=94 (78.33%)	p-value	With Depression n=19 (15.83%)	Without depression n=101 (84.16%)	p-value
ADVERSE EVENTS												
YES	14 (34.15)	22 (27.85)	0.48	20 (44.44)	16 (21.33)	0.01*	8 (30.77)	28 (29.79)	0.92	4 (21.05)	32 (31.68)	0.35
NO	27 (65.85)	57 (72.15)		25 (55.56)	59 (78.67)		18 (69.23)	66 (70.21)		15 (78.95)	69 (68.32)	
SUPPORT OF PARTNER												
YES	38 (92.68)	77 (97.47)	0.21	41 (91.11)	74 (98.67)	0.04*	24 (92.31)	91 (96.81)	0.31	17 (89.47)	98 (97.03)	0.13
NO	3 (7.32)	2 (2.53)		4 (8.89)	1 (1.33)		2 (7.69)	3 (3.19)		2 (10.53)	3 (2.97)	
SUPPORT OF IN-LAWS												
YES	29 (70.73)	68 (86.08)	0.04*	33 (73.33)	59 (78.67)	0.50	17 (65.38)	74 (78.72)	0.16	15 (78.95)	76 (75.25)	0.73
NO	12 (29.27)	11 (13.92)		12 (26.67)	16 (21.33)		9 (34.62)	20 (21.28)		4 (21.05)	25 (24.75)	
SUPPORT OF PARENTS												
YES	38 (92.68)	77 (97.47)	0.39	43 (95.56)	71 (94.67)	0.83	25 (96.15)	88 (93.62)	0.63	18 (94.74)	95 (94.06)	0.91
NO	5 (12.20)	2 (2.53)		2 (4.44)	4 (5.33)		1 (3.85)	6 (6.38)		1 (5.26)	6 (5.94)	

causation of PPD, these should be aimed for. Our study even mentions the importance of involving a Clinical pharmacist for the management of PPD who provided interventional supportive counselling to the depressed women and because of which there was a decrease in the number of depressed women over 4 weeks. Thus, from this study, we can conclude that Clinical pharmacists have a significant and positive impact on patient care and therapeutic outcomes through effective counselling. Further, more extensive studies involving community-based samples in the future might help identify additional risks. Factors for PPD in different populations and the training of paramedics and involving them in antenatal care can improve maternal mental health to a great extent.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

PPD: Postpartum Depression; **DASS:** Depression, Anxiety and Stress Scale; **EPDS:** Edinburgh Postnatal Depression; **DSM:** Diagnostic and Statistical Manual of Mental Disorders; **SES:** Socioeconomics Status.

REFERENCES

1. Shivalli S, Gururaj N. Postnatal depression among rural women in South India: Do socio-demographic, obstetric and pregnancy outcome have a role to play? PLOS ONE. 2015;10(4):e0122079. doi: 10.1371/journal.pone.0122079, PMID 25848761.

2. Dennis CL, Hodnett ED. Psychosocial and psychological interventions for treating postpartum depression. Cochrane Database Syst Rev. 2007;4(4):CD006116. doi: 10.1002/14651858.CD006116.pub2, PMID 17943888.

3. Stewart DE, Vigod SN. Postpartum depression: Pathophysiology, treatment, and Emerging Therapeutics. Annu Rev Med. 2019 Jan 27;70:183-96. doi: 10.1146/annurev-med-041217-011106, PMID 30691372. Shorey S, Chee CYI, Ng ED, Chan YH, Tam WWS, Chong YS. Prevalence and incidence of postpartum depression among healthy mothers: A systematic review and meta-analysis. J Psychiatr Res. 2018;104:235-48. doi: 10.1016/j.jpsychires.2018.08.001, PMID 30114665.

4. Shorey S, Chee CYI, Ng ED, Chan YH, Tam WWS, Chong YS. Prevalence and incidence of postpartum depression among healthy mothers: A systematic review and meta-analysis. J Psychiatr Res. 2018;104:235-48. doi: 10.1016/j.jpsychires.2018.08.001, PMID 30114665.

5. Patel HL, Ganjiwale JD, Nimbalkar AS, Vani SN, Vasa R, Nimbalkar SM. Characteristics of postpartum depression in Anand district, Gujarat, India. J Trop Pediatr. 2015;61(5):364-9. doi: 10.1093/tropej/fmv046, PMID 26179494.

6. Kunwar D, Corey EK, Sharma P, Risal A. Screening for postpartum depression and associated factors among women who deliver at a University Hospital, Nepal. Kathmandu Univ Med J. 2015;13(1):44-8.

7. Hirani D, Bala DV. A study of postnatal depression and its determinants in postnatal women residing in rural areas of Ahmedabad district, Gujarat, India. IOSR JDMS. 2015;14(7):10-5.

8. Gjerdingen D. The effectiveness of various postpartum depression treatments and the impact of antidepressant drugs on nursing infants. J Am Board Fam Pract. 2003;16(5):372-82. doi: 10.3122/jabfm.16.5.372, PMID 14645327.

9. Upadhyay RP, Chowdhury R, Aslyeh Salehi A, Sarkar K, Singh SK, Sinha B, *et al.* Postpartum depression in India: A systematic review and meta-analysis. Bull World Health Organ. 2017;95(10):706-717C. doi: 10.2471/BLT.17.192237, PMID 29147043.

10. Stewart DE, Robertson E, Dennis CL, Grace SL, Wallington T. Postpartum depression: Literature review of risk factors and interventions. Toronto: University Health Network Women's Health Program for Toronto Public Health; 2003.

11. Kheirabadi GR, Maracy MR, Barekatain M, Salehi M, Sadri GH, Kelishadi M, *et al.*

Risk factors of postpartum depression in rural areas of Isfahan Province, Iran. Arch Iran Med. 2009;12(5):461-7. PMID 19722767.

12. Modi VP, Parikh MN, Valipay SK. A study on prevalence of postpartum depression and correlation with risk factors. Ann Indian Psychiatry. 2018;2(1):27.

13. Azad R, Fahmi R, Shrestha S, Joshi H, Hasan M, Khan ANS, *et al*. Prevalence and risk factors of postpartum depression within one year after birth in urban slums of Dhaka, Bangladesh. PLOS ONE. 2019;14(5):e0215735. doi: 10.1371/journal.pone.0215735, PMID 31048832.

14. Gokhale AV, Vaja A. Screening for postpartum depression. Gujarat Med J. 2013;68(2):46-51.

15. Gupta S, Kishore J, Mala YM, Ramji S, Aggarwal R. Postpartum depression in north Indian women: Prevalence and risk factors. J Obstet Gynaecol India. 2013;63(4):223-9. doi: 10.1007/s13224-013-0399-x, PMID 24431646.

16. Rahman A, Iqbal Z, Harrington R. Life events, social support and depression in childbirth: Perspectives from a rural community in the developing world. Psychol Med. 2003;33(7):1161-7. doi: 10.1017/s0033291703008286, PMID 14580070.

17. O'hara MW, Swain AM. Rates and risk of postpartum depression—a meta-analysis. Int Rev Psychiatry. 1996;8(1):37-54.

18. Miller RL, Pallant JF, Negri LM. Anxiety and stress in the postpartum: Is there more to postnatal distress than depression? BMC Psychiatry. 2006;6:12. doi: 10.1186/1471-244X-6-12, PMID 16563155.

19. Anokye R, Acheampong E, Budu-Ainooson A, Obeng EI, Akwasi AG. Prevalence of postpartum depression and interventions utilized for its management. Ann Gen Psychiatry. 2018;17(1):18. doi: 10.1186/s12991-018-0188-0, PMID 29760762.

20. Shorey S, Chee C, Chong YS, Ng ED, Lau Y, Dennis CL. Evaluation of technology-based peer support intervention program for preventing postnatal depression: Protocol for a randomized controlled trial. JMIR Res Protoc. 2018;7(3):e81. doi: 10.2196/resprot.9416, PMID 29540338.

21. Guin G, Rawat S. Prevalence of postpartum depression and association with risk factors in a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol;7(3):1095.