RESEARCH ARTICLE

The burden of postnatal depression and perceived stress in mothers – what do we observe and learn?

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ABSTRACT

Background: Stress and depression, occurring together during pregnancy, can have seriously adverse outcomes on the mother, the foetus and her newborn. It can lead to low birth weight, preterm births and foetal growth restriction on the one hand and neuro-psychological effects such as anxiety during pregnancy and puerperium on the other. **Objectives:** This research was aimed at analysing the determinants of both depression and stress, using Edinburgh Postnatal Depression Scale (EPDS) and Perceived Stress Scale (PSS) among postnatal women in Kerala. **Methods:** A total of 119 women between 2 to 6 weeks of postpartum period were subjected to 10-point EPDS and PSS questionnaires. Screening and diagnosis of postpartum stress were based on Perceived Stress Scale (PSS), and graded as 'mild' (0-13), 'moderate' (14-26) or 'severe' (27-40). EPDS >13 was used to screen the patients with depressive symptoms. **Results**: The proportion of mothers with moderate depression and stress was 26.05% Young age at marriage (p value-0.013), love marriage (p value-0.05), low self-esteem (p value - 0.001), and inadequate relationship with the in-laws (p value-0.001) and parents were strong predictors. The gestational age at delivery was 1.17 weeks earlier in PND mothers which was statistically significant and babies born to these mothers weighed 228 grams lighter than non-depressed mothers. The gender of the newborn, fear of and/or preference for a particular gender and order of female child in multiparous woman had no association in determining postnatal stress and PND. Mothers with childcare stress (p value - 0.002), familial and personal history of depression and psychiatric illness (p value - 0.001) had greater chances of developing PND and stress. **Conclusions**: Gestational age at birth and caesarean delivery were significant determinants. Women with low self- esteem and poor support from family had the risk of developing depression. Therefore it is recommended that PND screening should be an integral part of postnatal care. Mothers with a history of depressive illness need to be screened early in antenatal period. Timely detection should be made and adequate counselling offered to the mothers who are screened positive.

Keywords: Postnatal stress, postnatal depression, determinants, social, marital, obstetric, factors, gender.

Pregnancy and childbirth produce a variety of physiological, psychological and social consequences. Attitudes toward pregnancy and childbirth vary from culture to culture. A mother's ongoing depression can contribute to the child's emotional, behavioural, cognitive and interpersonal problems in later life. Depression during pregnancy is recognized as a global health issue due to its high prevalence. It exercises a negative influence on the maternal and foetal outcome, and causes susceptibility to postnatal depression. This can have a substantial effect on children and women, lead to a wide range of maternal and neonatal complications, and even reach extremes ranging from maternal suicide to infanticide.[1-6] Studies in India have found the prevalence of postnatal depression ranging from 11 to 26.3% .[7-8] "Perceived stress" means the feelings or thoughts that individuals have about how much stress they are under at a given time or over a given period, how they feel about the general stressfulness of their life and their

ability to handle such stress. [9]

The 'foetal programming hypotheses' has been confirmed, and it is now proven that prenatal events and stressors play a crucial role in programming the infant brain and affecting its metabolism via the stress hormone.[10-11] Maternal stress during pregnancy has been associated with spontaneous pregnancy loss, preterm labour, low birth weight, preeclampsia, immune system suppression, excessive nausea and vomiting during pregnancy and higher incidence of caesarean deliveries.[12-15] In addition, children of stressed and depressed mothers are at risk of delay in growth and development and reduced cognitive, neuropsychological, social and emotional skills through their childhood and into their adolescence.[16] Given the profound disruptive influences of postnatal stress for both the mother and the child, early detection and treatment of vulnerable women at risk for the same are essential. It is also a potential predictor of depression during and after pregnancy, and schizophrenia among the male offspring. [17] Public health system can have spill-over effects from both short and long - term effects of stress. Powerful factors that increase or decrease stress include social support, quality of life and socioeconomic status.[18-20] Among these, socioeconomic status plays a crucial role in the stress perceived by pregnant women.[21] Women with a low socioeconomic status are likely to experience greater stress during pregnancy than those with a higher socioeconomic status. [22] Socioeconomic concerns, household chores, adverse life events, chronic illness of relatives and pregnancy related concerns are also identified as important stressors. Child care stress, breastfeeding issues, partner abuse/violence and gender issues (fear of and/or preference for any particular gender) create unnecessary stress in women.[8]

The American College of Obstetrics and Gynaecology (ACOG) advocated screening all women for psychosocial stress and other psychosocial issues during each trimester of pregnancy and the postpartum period. [23] Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perceived stress.

Kerala is a state that enjoys 100% literacy, records nearly 100% institutional delivery, and offers access to health-care. [24] But maternal morbidity, neonatal mortality rate and morbidity, caused by both preterm labour and low birth rate, are on the higher side. In Kerala, where social and family dynamics are undergoing transition and maternal stress is on the rise, this research sought to know the determinants of

stress and postnatal depression with the aim of ensuring better perinatal mental health

Methodology

This study conducted in the department of Obstetrics and Gynaecology of Travancore Medical College was from December 2018 to March 2019 on 119 mothers in their postpartum state (2-6 weeks).

We decided to study at least 96 postnatal mothers, based on minimum estimated PND prevalence of 10% with 6% precision, 95% confidence level. [25] Women with acute illness or cognitive impairment and those unwilling to give their consent for voluntary participation were excluded. The primary outcome variable was the proportion of postnatal depression and perceived stress while analysing the determinants was the secondary outcome.

Data was collected using EPDS to detect the depressive symptoms. The EPDS scale has ten components in it. In India, the Malayalam version of the EPDS has been validated as a screening tool to detect prenatal depression at various stages, and found to have a sensitivity of 100% and a specificity of 84.9%, at a cut-off score of 13. Each item is rated from 0 to 3, yielding a total score of 0-30. Seven of its items are reverse-scored. Possible depression is suggested by a score of 13 or more. The scale was administered by the investigator in the language known to the patient for ease of understanding, which was Malayalam.

The Malayalam version of the stress scale questionnaire was used to calculate the prevalence of postnatal stress in the present study. Maternal stress was assessed by the 10-item PSS by Sheldon Cohen, which determines the degree to which situations of the previous month have been appraised as stressful. Screening and diagnosis of postpartum stress were done based on PSS, with 0-13 graded as 'mild', 14-26 as 'moderate', and 27-40 'severe'. The items were easy to understand and the response alternatives, simple to grasp. It was rated on a five-point scale ranging from 'never' to 'very often'. PSS scores were obtained by reversing responses (e.g., 0=4, 1=3, 2=2, 3=1 and 4=0) to the four positively stated items (4, 5, 7, and 8) and then summing across all scale items.

Ethics approval was obtained from the institutional ethical committee. Each potential participant was informed about the objectives of study, and the implications of providing personal information. They were recruited in the study only after they gave their informed consent. They had freedom to opt out of the study, without running any risk of losing their rights to medical support at the hospital. The

collected information was filled with due regard to its confidentiality, and in the event of any screening turning positive for depression, the participant/patient was given a referral to the psychiatry department. The mental state was confirmed by a psychiatrist and treated as per treatment protocol followed at the psychiatry unit in Travancore Medical College and Hospital.

Assessment of risk factors -

A questionnaire was designed for the assessment of risk factors for postnatal stress and depression based on previously reported risk factors. Social and demographic details including age, educational qualification, family structure (nuclear/joint), occupation, environmental health status (housing, overcrowding) and socio-economic status were sought. The anthropometric measurements [pre-pregnancy weight, height, body mass index(BMI)] were noted. Obstetric history included number and gender of children, and present pregnancy (wanted/unwanted, planned/unplanned, fears and expectations regarding gender of child, mode of delivery, complications both during pregnancy and delivery). Infant characteristics like birth weight, NICU stay, breast-feeding issues and child-care stress were noted. The history of previous personal and first degree family psychiatric disorder, and treatment for the same along with the relationship with the spouse, parents and in-laws were carefully assessed.

Data analysis -

Data was analysed with the aid of the software SPSS version 15.0. Results were expressed as frequencies and proportions for categorical variables and mean and standard deviations for continuous variables. The prevalence of PND

(CIs) were calculated by logistic regression using the enter method. Statistical significance was set at a P value <0.05 as significant.

Results

In total, 119 postnatal mothers participated in the study. Screening and diagnosis of postpartum stress were based on perceived stress scale (PSS) which was graded as 'mild' (0-13), 'moderate' (14-26) or 'severe' (27-40). EPDS >13 was used to screen the depressive symptoms.

Screening of participants yielded the following results: Frequency of dual burden of depression and stress - (EPDS >13 and PSS > 14) – 31 mothers (26.05%); Frequency of neither   i.e., (EPDS <12 and PSS <13) –   88 mothers (73.95%).

Table 1: Association between socio-demographic characteristics and dual burden

Variables	Depressed mothers with stress (N=31)	Non-depressed Mothers (N=88)	P-value
Age of mother in years			
<20	2(40.0%)	3(60.0%)	0.263
20-30	21(22.6%)	72(77.4%)	
>30	8(38.1%)	13(61.9%)	
Education of mother			
Tenth	2(20.0%)	8(80.0%)	0.932
Plus two	8(29.6%)	19(70.4%)	
Graduate	11(26.8%)	30(73.2%)	
Post graduate	10(24.4%)	31(75.6%)	
Planned pregnancy			
Yes	28(27.7%)	73(72.3%)	0.325
No	3(16.7%)	15(83.3%)	

The mean age of the women in this study was 27.13 ± 3.93 years (range = 18–36 years). Among the socio-demographic variables, no association was noted with the maternal age. Education of the mother was not a predictor of PND in his study (table 1).

Mothers with LSCS were more depressed than normal

Table 2: Association between obstetric characteristics and dual burden

Variables	Depressed mothers with stress (N=31)	Non-depressed mothers (N=88)	Odds ratio	Confidence limits	Chi-square	P-value
Gravida						
Primigravida	17(29.8%)	40(70.2%)	1.39	0.612-3.185	0.632	0.426
G2 and above	14(23.3%)	46(76.7%)				
Gestational age of delivery in weeks						
<36.6	12(40.0%)	18(60.0%)	2.45	1.009-5.976	4.053	0.044*
>37	19(21.3%)	70(78.7%)				
Mode of delivery						
Vaginal delivery	8(15.4%)	44(84.6%)	0.34	0.140-0.861	5.454	0.020*
LSCS	23(34.3%)	44(65.7%)				

LSCS – Lower segment caesarean section.
P- value <0.05 is considered significant.

and stress was calculated as percentage of women who scored > 13 in EPDS and >14 in PSS. Chi-square test was applied to capture the differences in proportions of PND across socio-demographic, obstetric and pregnancy outcome variables. Odd ratios (OR) and 95% confidence intervals

labours (p value - 0.020). Mothers with preterm labour had elevated EPDS scores (table 2).

Love marriage and inadequate relationship with the in-laws and parents were significantly associated with both postnatal depression (PND) and stress. Women with low

Table 3: Association between family characteristics and dual burden

Variables	Depressed mothers with stress (N=31)	Non-depressed mothers (N=88)	Odds ratio	Confidence limits	Chi-square	P-value
Age at marriage						
<20	9(24.3%)	28(75.7%)	-	-	8.737	0.013*
20-30	19(24.1%)	60(75.9%)				
>30	3(100%)	0(0.0%)				
Type of marriage						
Arranged	21(22.1%)	74(77.9%)	0.39	0.154-1.022	3.806	0.05*
Love	10(41.7%)	14(58.3%)				
Relationship with						
a) Spouse						
Good	19(22.9%)	64(77.1%)	0.59	0.251-1.405	1.421	0.233
Not good	12(33.3%)	24(66.7%)				
b) In-laws						
Good	14(17.3%)	67(82.7%)	0.25	0.109-0.610	10.119	0.001*
Not good	17(44.7%)	21(55.3%)				
c) Parents						
Good	23(22.8%)	78(77.2%)	0.36	0.130-1.042	3.725	0.05*
Not good	8(44.4%)	10(55.6%)				
Social support-low						
Yes	15(23.1%)	50(76.9%)	0.713	0.313-1.619	0.657	0.417
No	16(29.6%)	38(70.4%)				
Low self esteem						
Low	15(50.0%)	15(50.0%)	4.56	1.860-11.190	11.943	0.001*
Good	16(18.0%)	73(82.0%)				

P - value <0.05 is considered significant.

self-esteem (p-value 0.001) were 4.56 greater odds to develop stress along with postnatal depression (table 3).

were similar in both the groups. Gestational age at delivery was 1.17 weeks earlier in depressed mothers and was

Table 4: Association between foetal characteristics and dual burden

Variables	Depressed Mothers with stress (N=31)	Non-depressed mothers (N=88)	Odds ratio	Confidence limits	Chi- square	P-value
Gender fear						
Yes	14(34.1%)	27(65.9%)	-	-	2.818	0.244
No	15(23.8%)	48(76.2%)				
No preferences	2(13.3%)	13(86.7%)				
Birth weight (gm)						
<1499	4(36.4%)	7(63.6%)	-	-	3.882	0.274
1500-2499	10(37.0%)	17(63.0%)				
2500-3499	13(19.4%)	54(80.6%)				
>3500	4(28.6%)	10(71.4%)				
Child care stress						
Yes	11(52.4%)	10(47.6%)	4.29	1.598-11.514	9.177	0.002*
No	20(20.4%)	78(79.6%)				
Breast feeding problems						
Yes	11(27.5%)	29(72.5%)	1.11	0.474-2.643	0.066	0.798
No	20(25.3%)	59(74.7%)				

P - value <0.05 is considered significant.

The gender of the new-born, fear of and/or preference for a particular gender and order of female child in multiparous woman had no association in determining postnatal stress and PND. Mothers with childcare stress increased odds of developing PND (table 4).

Familial and personal history of depression / psychiatric illness accelerated the chances of succumbing to PND and stress (table 5).

Maternal and paternal age was comparable. Anthropometric variables like maternal height and weight

statistically significant. Babies born to dual burdened mothers weighed 228 grams lighter (2527 gm) than those of the non-depressed (2755gms) (table 6). Babies born to depressed mothers stayed longer in the neonatal ICU than their comparison group.

Discussion

The purpose of the study was to screen postnatal women for mental health disorders and to determine the factors associated with mental health disorders in pregnancy. Among the sociodemographic factors, we could not identify

Table 5 : Association between psychiatric characteristics and dual burden

Variables	Depressed mothers with stress (N=31)	Non-depressed (N=88)	Odds ratio	Confidence limits	Chi-square	P-value
Personal history of depression						
Yes	11(61.1%)	7(38.9%)	6.36	2.191-18.490	13.533	0.001*
No	20(19.8%)	81(80.2%)				
Psychiatric illness in family						
Yes	10(76.9%)	3(23.1%)	13.49	3.409-53.409	19.607	0.001*
No	21(19.8%)	85(80.2%)				
P- value <0.05 is considered significant.						

Table 6: Comparison between depressed and non-depressed mothers

Variables	Mean	Depressed mothers with stress	Non depressed	Significance*
Maternal age in years	27.13	27.65	26.95	0.433
Paternal age in years	33.00	33.16	32.94	0.825
Age at marriage in years	22.73	23.45	22.48	0.203
Height in cm	157.02	156.19	157.31	0.344
Weight in kg	67.03	64.74	67.83	0.276
Baby weight in kg	2695.64	2527.10	2755.01	0.143
GA at delivery in weeks	36.976	35.80	37.39	0.024*
NICU stay in days	2.82	3.52	2.57	0.502

P- value <0.05 is considered significant.
*Independent sample test

any relevant association of pregnancy related stress with maternal/paternal age, as in Suguna et al.[26]

Women who were younger at the time of marriage developed depression significantly, according to this research, as is also observed in Suguna et al and Liu et al of China. [26-27]

On comparing modes of delivery, the prevalence of postnatal depression was seen to be more in women who delivered through lower segment caesarean section [28] probably because of the post-delivery pain of the incision in LSCS and morbidity associated with the procedure.

In this study, there was no association between depression and planning of pregnancy, unlike what was observed in Modi et al and Sivaprakasam et al. [29-30]

The gender of the baby, fear of gender /preference for any particular gender had no role in determining postnatal depression, according to the present research. This was similar to the results of studies conducted within Western societies. In contrast, mothers who gave birth to a female child in several other Indian states (Goa, Tamil Nadu) had increased odds of developing PND.[31-32] The birth of baby girl is considered as a family and social stressor in Indian societies in contrast to the matriarchal attitude prevalent in the state of Kerala.

Personal and familial history of depression and inadequate relationship with in-laws were significantly associated with PND .[33-34]

The development of both PND and stress increased manifold (OR 13.533 and 19.607) (p-value 0.001) among women who had psychiatric history in family, and a personal history of depression. Women with low self-esteem (p-value 0.001) were 4.56 times more prone to developing stress and postnatal depression, and is in sync with Beck's observation. [8, 35] Gender fear issues were not a predictor of postnatal depression in this research, and this finding is similar to what was noted in Sivaprakasam et al[30] but in contrast to Johnson et al.[36]

Social support among pregnant women in the low income bracket of the African - American community was studied by Landon, and a significant relationship between perceived support and depressive symptomatology following delivery was found. But there was no relationship between received support and postpartum depression and stress, which emphasised that social support received was not a predictor for PND.[37] Beck studied two variables related to the infant – child temperament and childcare stress – and he found that women who suffered from childcare stress and nursed an infant with a difficult temperament were at increased odds of developing postpartum depressive symptomatology similar to the observation in this research.[8]

The impact of breastfeeding on both stress and immunity has been crucial in the development of postnatal stress in various studies but no such association was found in this research. [38-40]

The gestational age at delivery was 1.17weeks earlier in mothers with PND which was statistically very significant and babies born to these mothers weighed 228 grams lighter than non-depressed mothers.

Limitations - The prevalence/proportion detected by the study may be an underestimation of the problem as some women who are depressed may not turn up at the hospital. Hence community-based surveys and prospective studies are

better alternatives in such situations. More extensive studies involving larger samples in future might be helpful in identifying additional risk factors for postpartum depression.

Conclusions

This result showed that woman with history of depressive illness, low self-esteem and lack of support from family need to be identified and these factors taken into consideration when planning intervention and preventive strategies for the new mothers. Timely detection   and counselling have to be offered to the mothers who are screened positive.

Conflict of interest: None. **Disclaimer:** Nil.

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