Prevalence and Predictors of Anxiety and Depression among Perinatal Women in Tertiary Care Hospital: A Cross-Sectional Study

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Abstract

Introduction   The perinatal period is a critical time in a woman's life. The impact of perinatal mental disorders includes new evidence of an increase in their prevalence among young pregnant women. Perinatal mental disorders are one of the most common and undertreated morbidities. Early detection of perinatal mental illness may be supported by evidence on risk factors. Our study aimed to identify the prevalence and risk factors of anxiety and depression and to determine the association between them.

Materials and Methods   A prospective observational questionnaire-based study was conducted in the obstetrics and gynecology department of a tertiary care hospital for a duration of 6 months. With random sampling, 741 participants were recruited for the study based on inclusion and exclusion criteria. The data were analyzed using SPSS version 28.

Results   The prevalence of perinatal anxiety and depression was found to be 48.5 and 32.2%, respectively. We discovered a substantial link between perinatal depression and anxiety, with an odds ratio of 3.9. The predictors are gestational age, postpartum age, comorbid conditions, morning sickness, sleep disturbance, sleep duration, loss of appetite, loss of interest in their favorite food, type of family, and presence of risk in their pregnancy.

Conclusion   Early screening and intervention may drastically and significantly reduce mental disorders existing in the pregnant population. So as health care professionals, we suggest that screening and counseling for depression and anxiety could be included as routine processes in antenatal care.

Keywords
► perinatal period
► depression
► anxiety
► mental health

Introduction

Perinatal period is defined as the period of time occurring when you become pregnant and up to a year after giving birth. Perinatal period is the most vulnerable time span in a woman's life.[1] During this period, physiological and psychological changes occur, which lead to an increase in the risk of both physical and mental health issues among perinatal women. A physiological problem during pregnancy includes gravid diabetes, preeclampsia, thyroid disease, and anemia.

Psychological problems are characterized by significant levels of depressive, anxiety, and somatic symptoms.[2] The most prevalent perinatal mental illness is perinatal depression (PND), perinatal anxiety, postpartum blues, and postpartum psychosis. PND is a mood disorder that involves the brain which affects behavior and physical health in women; it has the same features as depression in the general population such as anhedonia, depressed mood, lack of desire, inattentive, and feelings of low self-esteem. In Indian population, the prevalence of antenatal depression and postpartum depression was found to be 35.7%[3] and 22%.[4] Around 23% of women with postpartum depression experience symptoms of depression during their gestation period.[5] Perinatal anxiety is a mental health disorder characterized by feeling anxious, which involves changes to one's thoughts, actions, feelings, and bodily sensations during perinatal period.[6] In Indian population, the prevalence of antenatal anxiety and postpartum anxiety was found to be 55.7%[7] and 13 to 40%, respectively.[8] Postpartum blues are characterized by gloomy and mild depressive symptoms which are transitory and self-limited.[9] The symptoms include sadness, irritability, anxiety, crying, exhaustion, decreased sleep, decreased concentration, appetite changes, and labile mood.[10] The symptoms develop within 2 to 3 days of childbirth, progress to peak over the next few days, resolve by themselves within 2 weeks of their onset, and if it persists, it may lead to postpartum depression.[11] Postpartum (or puerperal) psychosis is the rarest and most severe form of postpartum affective disorders, with an incidence rate of one to two episodes per 1,000 live births. Approximately 20 to 30% of women worldwide experienced at least one psychiatric disorder during their antenatal or postpartum.[12] About 50% of women with depression were not diagnosed during this period.[13] The World Health Organization emphasized the crucial call for "cost-effective, evidence-based, and human rights oriented social care services and mental health in community-based settings for early identification and management of maternal mental illness."[14] Pregnant women often come with atypical symptoms of depression and suitable physical complaints such as fatigue, lack of energy, changes in appetite, and sleep disturbances, rather than an actual diagnosis of depression. Therefore, it can be challenging to differentiate between normal pregnancy symptoms, which are prevalent during pregnancy and atypical somatic complaints which may be associated with depression or anxiety. We mainly focus to identify the prevalence of anxiety and depression, to identify the risk factors associated with PND and anxiety, and to identify the association between them among the perinatal population.

Materials and Methods

Study Design
Prospective observational questionnaire-based cross-sectional study was conducted among 741 perinatal women in obstetrics and gynecology department in a tertiary care hospital for a period of 6 months.

Study Participants and Sampling
The study was performed among perinatal women, and the purpose of the study was very well explained to the participants. Informed consent was obtained and maintained confidentially. Participants were recruited by random sampling based on inclusion and exclusion criteria. Pregnant women and breastfeeding women up to 1 year postpregnancy between 21 and 40 years were included. Perinatal women who are not willing to participate in the study, aged less than 21 years and more than 40 years, and with an existing psychiatric condition were excluded from the study.

Data Collection Tools
Prevalidated questionnaire was used for data collection. The questionnaire was validated by a panel of seven members: one physician and one nurse from the department of obstetrics and gynecology, one psycho counselor from the department of psychiatry, two teaching faculty from pharmacy practice department, one teaching faculty from pharmaceutics department, and one layperson. The questionnaire was validated for adequateness and relevance of content, clarity, understandability, appropriateness of scoring system adapted, and other criteria. Once validated, the questionnaire was used for data collection.

Data are collected through face-to-face interview with the study participants. The questionnaire was divided into three sections, the first section comprised sociodemographic details such as age, height, weight, education, family information, etc.; the second section contains seven questions regarding the anxiety of the participants, and the third section contains six questions regarding the depression of the participants. Scoring was given to the question of anxiety and depression, based on the responses. Scoring for the second section was 1 for not at all, 2 for sometimes, 3 for often, and 4 for always. In the third section for the first and second questions, the scoring was 1 for always, 2 for often, 3 for sometimes, and 4 for not at all; for the remaining question, scoring was 1 for not at all, 2 for sometimes, 3 for often, and 4 for always. For overall anxiety scoring: 5 to 9 "mild," 10 to 14 "moderate," >14 "severe"; for depression: 5 to 6 "mild," 7 to 8 "moderate," >8 "severe."

Analysis Design
The collected data were analyzed with IBM SPSS statistics software 28.0 version. The sociodemographics were expressed with descriptive statistics as frequency and percentage of analysis. The association between anxiety and depression among perinatal women was assessed using chi-square test and odds ratio. Probability value of < 0.05 was considered as significant in statistical tools.

Result

A total of 759 patients were enrolled in the study; 741 participants were recruited based on inclusion and exclusion criteria, 14 participants were below 21 years, and 4 participants were above 40 years.

In our study, majority of the study participants belonged to age group 25 to 30 years, 344 (46.4%); followed by 21 to 25 years, 264 (35.6%); 30 to 35 years, 115 (15.5%); and 35 to 40 years, 18 (2.4%). Participants with body mass index (BMI) <18 were considered underweight (3.5%), BMI of 18.5 to 24.9 were healthy (32%), BMI of 25 to 29.9 were overweight (37.9%), and BMI of 30 to 39.9 were obese classes 1 and 2 (25%), and >40 were as obese class 3 (1.6%). Subjects were classified into three educational categories in which majority of the study participants belonged to college level 617 (83.2%), followed by school level 123 (16.7%) and illiterate 1 (0.1%). Majority of participants 362 (48.9%) were in the third trimester, 159 (21.4%) in the second trimester, 100 (13.5%) in the first trimester, and 120 (16.2%) in the postpartum period. Around 451 (60.9%) participants were in primigravid and 290 (39.1%) were in multigravid. Women living in the joint families were 411 (55.5%) and nuclear families were 330 (44.5%). The estimated household income <10,000 was 50 (6.7%); 10,000 to 30,000 was 415 (56%); 30,000 to 50,000 was 147 (19.8%); and >50,000 was 129 (17.4%).

In our study, 236 (31.8%) participants had comorbid condition among which the majority of participants 131 (55.5%) had thyroid as a comorbid condition; 61 (25.8%) had diabetes mellitus; 14 (5.9%) had hypertension; 12 (1.6%) had both diabetes mellitus and thyroid disorder; 1 (0.1%) had both hypertension and thyroid disorder; 1 (0.1%) had diabetes mellitus, thyroid disorder, and hypertension; and 16 (2.2%) had other conditions. One hundred fifty-seven participants were on medication and the remaining 79 followed lifestyle modification. The medications taken by the participants were thyroxine 107 (68.1%) for hypothyroidism, followed by 27 (17.1%) on metformin, 14 (8.9%) on insulin for diabetic mellitus, 3.8% ($n = 6$) on labetalol, 0.6% ($n = 1$) on metoprolol, 0.6% ($n = 1$) on amlodipine, and 0.6% ($n = 1$) on Amlong A for hypertension (►Table 1).

The participants were screened for anxiety and depression based on the questionnaire. A total of 360 (48.5%) participants have anxiety and 239 (32.25%) participants have depression.

On analyzing the level of anxiety among the perinatal population, we found a mild score of anxiety (5–7) in 31 participants in their first trimester, 58 in the second trimester, 120 in their third trimester, and 48 in postpartum phase; a moderate score of anxiety (10–14) in 14 participants in their first trimester, 20 in their second trimester, 38 in their third trimester, and 20 in postpartum phase; and a severe score of anxiety (>14) in 2 participants in their first trimester, 2 in their second trimester, 3 in their third trimester, and 4 in their postpartum phase.

On analyzing the level of depression among the perinatal population, we found a mild score of depression (5–6) in 10 participants in their first trimester, 24 in their second trimester, 53 in their third trimester, and 29 in their postpartum phase; a moderate score of depression (7–8) in 8 participants in their trimester, 20 in their second trimester, 27 in their third trimester, and 15 in their postpartum phase; a severe score of depression (>8) in 7 participants in their first trimester, 8 in their second trimester, 27 in their third trimester, and 11 in their postpartum phase.

On analyzing the association between anxiety with their demographic factors, we found that in participants who are in their gestational, postpartum age, abnormal sleep duration, there is 1.2-fold increase risk for the development of anxiety ($p = 0.006$); in participants with comorbid medical history ($p = 0.001$) and who lost their appetite ($p = 0.01$), there is 1.6-fold increased risk for the development of anxiety; in participants with sleep disturbance, there is 1.8-fold increase risk for the development of anxiety ($p = 0.002$), in participants with morning sickness affecting their daily function, there is a 2-fold increased risk for the development of anxiety ($p < 0.001$); in participants who lost interest in having food that they liked, there is 2.5-fold increase risk for the development of anxiety ($p < 0.001$).

On analyzing the association between depression, we found that in participants with disturbed sleep, there is 1.3-fold increase risk for the development of depression ($p = 0.05$); in participants living in nuclear family ($p = 0.021$) and who had morning sickness affecting daily functioning ($p = 0.033$), there is 1.4-fold increase risk for the development of depression; in participants who are in their gestational age, postpartum age, and who lost interest in having food that they liked ($p = 0.006$), there is 1.5-fold increase risk for the development of depression ($p < 0.001$); in participants with comorbid medical condition

Table 1 Medical and medication history of participants

Medical history	Frequency $n = 236$ (%)	Medication history Class of drugs	Name of the drug	Frequency $n = 236$ (%)
Diabetes mellitus	61 (25.8%)	Antidiabetic	Metformin	27 (17.1%)
Hypertension	14 (5.9%)		Insulin	14 (8.9%)
Thyroid disorder	131 (55.5%)	Antithyroid	Thyroxine	107 (68.1%)
Diabetes mellitus, thyroid disorder	12 (5.08%)	Antihypertensives	Labetalol	6 (3.8%)
Hypertension, thyroid disorder	1 (0.4%)		Metoprolol	1 (0.6%)
Hypertension, diabetes mellitus, thyroid disorder	1 (0.4%)		Amlodipine	1 (0.6%)
Others	16 (6.7%)		Amlong A	1 (0.6%)

($p < 0.003$) and who had sleep disturbance ($p = 0.009$), there is 1.6-fold increase risk for the development of depression; in participants with presence of risk in delivery ($p = 0.022$) and who lost appetite in past few months ($p = 0.001$), there is 1.7-fold increase risk for the development of depression. In participants with reduced neonate weight, there is fivefold increased risk for the development of depression ($p < 0.001$) (►Table 2).

We analyzed the relation between anxiety and depression and found a significant correlation of $p < 0.01$. Perinatal mothers with anxiety had a threefold increased risk of developing depression.

Discussion

In our study, 741 participants were enrolled from all three trimesters and postpartum period and assessed their mental health of perinatal women using the self-validated questionnaire. The prevalence of anxiety and depression and their levels of correlation were observed.

Table 2 Association of anxiety and depression with sociodemographic factors

Variables	Anxiety				Depression			
	With anxiety	Without anxiety	*p*-Value	Odds ratio	With depression	Without depression	*p*-Value	Odds ratio
Maternal age								
21–25	116	148	0.116	–	85	179	0.97	–
25–30	169	175			111	233		
30–35	66	49			38	77		
35–40	9	9			5	13		
Body mass index								
>18.5	12	14	0.951	–	10	16	0.179	–
18.5–24.9	115	122			72	165		
25–29.9	134	147			84	197		
30–39.9	92	93			66	119		
<40	7	5			7	5		
Education								
Illiterate	0	1	0.6	–	1	0	0.29	–
School level	51	50			37	64		
College level	309	330			201	438		
Husband's social history								
Present	31	25			24	32		
Absent	329	356	0.29	–	215	470	0.07	–
Type of family								
Nuclear	173	157			121	209		
Joint	187	224	0.06	–	118	298	0.02[a]	1.4
Source of income								
Both	92	106	0.84	–	68	130	0.73	–
Partner's job	243	253			154	342		
Own job	20	17			14	23		
Others	5	5			3	7		
Estimation of household income								
<10,000	25	25	0.86	–	20	30	0.54	–
10,000–30,000	195	219			131	284		
30,000–50,000	73	74			50	97		
>50,000	66	63			38	91		

Table 2 (*Continued*)

Variables	Anxiety				Depression			
	With anxiety	Without anxiety	*p*-Value	Odds ratio	With depression	Without depression	*p*-Value	Odds ratio
Gravida								
Primigravida	136	154			92	198		
Multigravida	224	227	0.46	–	147	304	0.8	–
Previous miscarriage								
Yes	77	83			42	118		
No	283	298	0.89	–	197	384	0.06	–
Planned pregnancy								
Yes	214	248			138	324		
No	146	133	0.11	–	101	178	0.07	–
Type of conception								
Normal	342	371			228	485		
Assisted	18	10	0.09	–	11	17	0.41	–
Gestational age								
First trimester	47	53			25	75		
Second trimester	80	79	0.006[a]	1.2	52	107	0.006[a]	1.5
Third trimester	161	201			107	255		
Postpartum age								
0–4 mo	69	48			53	64		
5–8 mo	2	0	<0.001[a]	1.2	1	1	<0.001[a]	1.5
9–12 mo	1	0			1	0		
Neonate's weight								
<2.5 kg	19	39			17	45		
>2.5 kg	29	33	0.138	–	38	20	<0.001	5
Comorbid condition								
Yes	143	102			98	147		
No	217	279	<0.001[a]	1.6	141	355	0.002[a*]	1.6
Presence of risk								
Yes	43	32			33	42		
No	317	349	0.11	–	206	460	0.02[a]	1.7
Presence of morning sickness affecting daily functioning								
Yes	183	138			117	204		
No	177	243	<0.001[a*]	2	122	298	0.03[a]	1.4
Sleep disturbance								
Yes	300	278			200	378		
No	60	103	0.002[a]	1.8	39	124	0.001[a]	1.6
Abnormal sleep duration								
Yes	144	101			93	152		
No	216	280	<0.001[a]	1.2	146	350	0.05[a]	1.3

(*Continued*)

Table 2 (*Continued*)

Variables	Anxiety				Depression			
	With anxiety	Without anxiety	*p*-Value	Odds ratio	With depression	Without depression	*p*-Value	Odds ratio
Loss of appetite								
Yes	118	88			88	118		
No	242	293	0.01[a]	1.6	151	384	0.001[a]	1.7
Loss of interest in their favorite food								
Yes	190	116			116	190		
No	170	265	<0.001[a]	2.5	123	312	0.006[a]	1.5

[a]$p < 0.05$.

In our study, the majority of participants were found to be in the age group of 21 to 30 years, which is similar to the study conducted by Rezaee and Framarzi.[15] Amendment bill was made in 2021 in the Prohibition of Child Marriage Act seeking to increase the minimum age of marriage for females to 21 years. This act ensures that girls are provided with a greater chance to proceed with their studies. Consequently, more women are expected to go into higher education, get jobs, and become financially independent. Majority of participants had completed their undergraduate and postgraduate. This result reflects the literacy rate in our area. As per census 2011, the urban female literacy rate in Tamil Nadu and Coimbatore was 82.31 and 79%, respectively. Our result shows no association between level of education and antenatal depression and anxiety which is similar to the study conducted by Agostini et al.[16] The majority of participants had good socioeconomic background (middle class) based on Centre for Monitoring Indian Economy. Good socioeconomic and education level may represent a protective factor for anxiety and depression in perinatal women. We found no significance results between anxiety and depression for socioeconomic background which is similar to the study conducted by Ross et al.[17] Majority of women were living in joint families and remaining of the women were living in nuclear families because of migration, support needs for the elderly and for children, and the need to share resources, urban families are stretching, joining, and evolving. Type of family has shown the significant result on depression. In our study, one-third of the women accepted that their pregnancy is not a planned one and the current pregnancy of more than one-half of women were primigravida, which is similar to the study conducted by Ayres et al.[18] In our study, one-fourth of participants had previous miscarriages which is similar to the study conducted by Waqas et al.[19] Reasons for previous miscarriage/abortion had health condition, decreased fetal growth, postpone or stop childbearing, relationship problems with a husband or partner and a woman's perception that she is too young constitute other important categories of reasons. Previous miscarriage has no significant result with depression and anxiety which is similar to the study

conducted by Fadzil et al.[20] Gestational age was a significant factor for antenatal anxiety and depression which is similar to that of the study conducted by Madhavanprabhakaran et al[21] and Fadzil et al.[20] Odds for antenatal anxiety was observed which was supported by previous study conducted by Figueiredo and Conde.[22] This can be explained by the fact that at the beginning of pregnancy, the mother-to-be experiences higher level of anxiety and depression, which decreases toward the later part of pregnancy, possibly due to psychological adjustment or coping mechanism. We suggested, therefore, that during the earlier part of pregnancy, antenatal care providers should screen expectant mothers for anxiety and depressive symptoms and take appropriate action to manage or minimize their anxiety. Pregnant women with obstetric risk/complication have more fear about the fetus, which may further leads to depression. In our study, we found a significant result between pregnancy risk and depression which is supported by the results from the study conducted by Kalra et al.[23] About half of the participants had cesarean section pregnancy and majority if the participants were housewives which is similar to the study conducted by Kamali.[24] The prevalence of anxiety in our study is similar to Rezaee and Framarzi.[15] The prevalence of depression in our study was found to be 38.25% which is similar to the study conducted by Lee et al.[25] More than one half and more than one-third of the women had antenatal anxiety and depressive symptoms, respectively, in at least one antenatal assessment. Anxiety was more prevalent than depression at all stages. Our result was supported by Lee et al.[25] Sleep disturbance is significantly correlated with anxiety and depression in our study. This is due to the fact that depressed women have significantly more fragmented sleep, as reflected by longer sleep latencies, longer periods of nocturnal wakefulness, and poorer sleep efficiency, which is supported from the results of the study conducted by Okun et al.[26] In our study, we found that morning sickness (hyperemesis gravidarum) is significantly correlated with anxiety and depression. Possible causes of morning sickness include high levels of hormones, blood pressure fluctuations, and changes in carbohydrate metabolism. Frequent headache, vomiting,

and nausea may cause increased tiredness, fatigue, bed-bound for weeks on end, suffer dehydration, and weight loss and are often unable to work which may lead to anxiety and depression. While eating healthy and staying sane are extremely important during pregnancy, loss of appetite is a common phenomenon that may cause serious problems to a woman's health. We found a significant relation between loss of appetite and PND and anxiety. High fluctuations in hormones such as leptin and the main pregnancy hormone called human chorionic gonadotropin can decrease hunger levels and trigger cramps and nausea. Depression and anxiety during pregnancy have been associated with many comorbid conditions, including preeclampsia, diabetes, premature birth, low birth weight, and postnatal complications. In our study, comorbid condition was significantly related to anxiety and depression in perinatal women, which is supported by the study conducted by Maharlouei et al.[27] There was a strong association between anxiety and depression disorders. Anxiety and depression are interlinked with each other. Some studies reported that patients with anxiety have increased risk to develop depression. And also, those patients with anxiety have 3.9-fold increased risk for the development of depression which is similar to Mohamad Yusuff et al.[28] The prevalence rate in depression is similar to the study conducted by Lee et al. More than one half and more than one-third of the women had antenatal anxiety and depressive symptoms, respectively, in at least one antenatal assessment. Anxiety was more prevalent than depression at all stages. Our result was supported by Lee et al.[25]

Conclusion

Early screening and intervention may drastically and significantly reduce mental disorders existing in the pregnant population. As a health care professional, we recommend to use screening tools for depression and anxiety as a routine process in antenatal care to provide beneficial effects in the improvement of social well-being during the perinatal period. Thus provide valuable information for the development of preventive interventions and treatments to improve the mental well-being of mothers during their perinatal period. Antenatal checkup given to women during their pregnancy period generally focuses on physical and physiological changes; much importance was not given to mental health.

Ethical Approval
The proposed study was approved by our institutional ethical committee.

Conflict of Interest
None declared.

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