

Comorbid Postpartum Anxiety and Depression and Associated Factors in Mothers with Pre-Term Births: A Descriptive Comparative Study.

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Abstract

Introduction Postpartum depression has been widely studied in relation to peripartum mental health disorders in women in low and middle income countries (LMICs). However, comorbid anxiety and depression and its precursors such as stress associated with neonatal care in hospital, survival of the baby, social support and maternal family dynamics are understudied in sub-Saharan Africa (SSA). Our focus was to determine the proportion of comorbid postpartum depression and anxiety among mothers of preterm infants receiving intensive care in newborn unit at Kenyatta National Hospital (KNH), compared to mothers of full-term healthy infants attending Mother Child Health Clinic (MCHC) at Umoja Health Center (UHC) in order to establish the association between comorbid anxiety and depression among mothers with pre-term babies and identify independent predictors of comorbid depression and anxiety. **Method** This is a descriptive comparative study, where 172 mother-infant dyads; 86 mothers from with term deliveries and 86 with pre-term deliveries were recruited. The participants completed the self-reported Socio-demographic questionnaire, Edinburgh Postnatal Depression Scale (EPDS), Kessler's 10 (K10) and Patient Health Questionnaire-4 (PHQ-4) to screen for levels of depression, psychological distress and anxiety. Chi-square tests was used to establish the association between comorbid depression and anxiety and socio-demographics. Multivariate logistic regression was used to assess the independent predictors of comorbid depression and anxiety. **Results** The overall proportion postpartum depression as measured by EPDS (≥ 13) was 44.2%, of these 77.6% were mothers with pre-term babies. Similarly, out of 35.1% who screened positive for anxiety 75% (n=45) of them were mothers with pre-term babies. Out of the 26.2% of mothers with psychological distress 75.6% (n=34) of them were mothers with pre-term babies. A total of 43 (25%) screened positive for comorbid depression and anxiety of these 83.7% were (n=36) mothers with pre-term babies. After controlling for all significant associations at bivariate level: the odds of comorbid depression and anxiety was about 6 times more among the mothers with pre-term birth as compared to full term births (A.O.R=5.75; p=0.002), 4.76 times more (A.O.R=4.76; p=0.043) among mothers who reported intimate partner violence as compared to those who did not and 5.95 times more among mothers who screened positive for psychological distress (A.O.R=5.95; p<0.001) as compared to those who screened negative. **Conclusion** This study found that there are higher proportions of mothers with depression, anxiety, and general distress among mothers with preterm births. Risk factors like IPV and psychological distress should be addressed in postpartum mothers regardless of full term or preterm births as a basic health right of a woman who has delivered. The health care team in Newborn Unit and in postnatal wards at KNH need to be sensitized around how to identify early signs of psychological disturbance among mothers of preterm infants in NICU. Routine group psychological counselling to NICU mothers soon after admission, and thereafter, to allay their fears and anxieties. It would be critical to carry out routine courses around maternal mental health for nursing staff.

Introduction

The birth of an infant is ordinarily supposed to bring joy to the mother and her family. To some women childbirth can be stressful and can alter their emotional well-being (1). Post-partum depression (PPD)

affects approximately 10-15% of women in general population (2). Undetected PPD can have adverse long-term effects on the mother, child (ren) and family, and can contribute to emotional, behavioral, cognitive and interpersonal problems to the child (ren)'s later life (3).

PPD affects both mothers of term and preterm infants. Mothers of preterm infants are particularly at high risk for poor postpartum functioning with rates of depression ranging between 14% - 27% (4). Studies have shown that mothers with preterm infants admitted in Neonatal Intensive Care Unit (NICU) are 40% more likely to develop PPD compared to general population (5). Multiple studies examining psychological maladjustments in mothers with preterm infants in NICU have reported higher rates of PPD ranging between 28-70% compared to mothers of healthy full-term infants (6,7). More recent studies have reported increased levels of acute stress and high levels of anxiety in mothers of preterm infants in NICU (8,9). PPD has received considerable research attention while postnatal anxiety (PNA) has been relatively neglected (10). Depressed and anxious mothers have communication difficulties which have a negative impact on the children and family (11). Preterm infants in particular appear more sensitive to the mother's poor mental state compared to full term infants (12-14). Depression and anxiety are common and debilitating complications of postpartum women however we suspect that anxiety and perhaps stress sets in earlier(15)and literature talks about the setting in of anxious depression.

The risk factor of PPD in general population includes unplanned or unwanted pregnancy, prior history of depression, life stress, poor social support, marital conflicts, single parent status, low socioeconomic status, anxiety or depression during pregnancy (11)as well as postpartum period for both mothers of full term and pre-term infants (16,17). Smoking during pregnancy has been identified as a risk factor for preterm delivery (16). Other additional risk factors for PPD and anxiety specific to mothers of preterm infants include: the delivery of preterm infant in its itself (18), stressful life events surrounding the delivery (8,18), separation of the mother and the baby (19,20), perception to words the baby, its small size, very low birth weight, appearance, general condition, infants survival, length of stay, feelings of incompetency, frightening unfamiliar NICU settings, lights, sounds, equipment and perception of poor support by healthcare providers (nurses) thus increasing maternal distress (21-23). However, in contrast to general population demographic risk factors such as prior maternal depression and anxiety, age and level of education, have not been consistently found in cohorts of mothers with preterm infants in NICU (24,25).

Three studies on the prevalence of PPD in mothers of full-term babies had been conducted in Nairobi, UON/KNH earlier (26-28), but no study on comorbid PPD and anxiety on mothers of preterm infants in NICU had been conducted as compared to mothers with term infants.

To address this gap, the current study aimed; (i) To assess the association between comorbid PPD and anxiety on mothers with preterm babies at NICU (4-6 weeks postnatal at hospital (for long stay infants) and before discharge (for shorter stay infants) as compared to mothers with term infants 6 weeks postnatal at the out-patient clinic. (ii) To establish the independent risk factors associated with comorbid PPD and anxiety in mothers with infants aged 6 weeks postnatal.

Methods

Participants and Methods

This is a comparative study embedded within a cross-sectional design. We recruited 172 mother-infant dyads. Mothers with pre-term births formed one group and mothers with full term delivery formed another.

Exclusion criteria: The study excluded mothers with chronic medical conditions, recent surgical and or obstetrical procedures apart from caesarean section, those with psychosis or with intellectual impairment. Critically ill infants, those with congenital deformities/ malfunctions and those severely ill on continuous life support ventilation.

Inclusion: Mothers of preterm infants who were admitted in NICU, in stable condition, with birth weight ranging between 500-2500g. The comparison group included mothers of normal full-term infants and their babies (both mother and child) in healthy condition attending maternal-child clinic at 6 weeks and mothers living with HIV, in stable health condition in both groups were included. Participation was voluntary after signing an informed consent form and participants were informed that they were free to leave the study at any point in time if they felt uncomfortable.

Settings

The study was conducted at Kenyatta National Hospital's Neonatal Care Unit for preterm infants and their mothers; while for mothers of full-term infants were contacted at Umoja health center that is part of Nairobi County. The researcher obtained institutional and ethical review permissions to conduct research at KNH and Umoja health center. The officers in charge of the newborn unit, post-natal wards and Umoja health center were approached and the intention to carry out a research within the facility was discussed. Permission was sought after presenting a copy of the approved research proposal, a letter from both University of Nairobi /Kenyatta National Hospital Ethics and Research Committee (ERC) (authorization no. P544/07/2016). For Umoja Health center, a similar protocol was observed. Permission was sought from the Medical Officer of Health (MOH) in the Department of Public Health City Hall after presenting the letters. Subsequently, we received county health approval HRD/3/4/2656/HO/2016 to collect data at the Umoja health center.

Measures

Socio-demographic interview

A researcher designed questionnaire was used to capture the participants' personal and family background information hypothesized to be risk factor in development of PPD and anxiety during the perinatal period. The factors covered included age, occupation, monthly income, partner employment, partner support, sexual and gender abuse, HIV status, history of mood disorders, and social support.

Edinburg postnatal depression scale (EPDS) screening tool

To screen for postpartum depression, EPDS was used. The EPDS is a 10 questions self-rating report with good validity. It assesses postpartum depression symptoms the mothers might have experienced within the last seven days. The score ranges between (0-30). A score of 13 and above is an indication of clinical depression of varying degree (27).

Kessler psychological distress scale (K10) - screening tool

K10 is a 10-items reliable and validated self-reporting instrument intended to yield a global measure of distress based in symptoms of anxiety and depression experienced in the recent 4 weeks period. A cut off score between 20 and 30, indicates mild to moderate mental disorder. Score above 30 indicate severe mental disorder of psychological distress(29).

Patient health questionnaire (PHQ4) screening tool

PH4Q screening tool was used to assess the level of anxiety and depression in each participant. PH4Q is ultra-belief validated two-item screener. It is a simple self-reporting measure. Scoring is determined by adding up the scores. Scores are rated as normal (0-2) moderate (3-5) and severe (9-12) (30).

Referral procedures for those with high scores, suicidality or distress.

All participants gave their full consent and completed the questionnaires appropriately. The mothers who had high scores for depression with suicidal ideation were contacted on phone. Those who came from Umoja area were referred to Umoja health Centre or to Mama Lucy hospital. Those who came from other different places were referred to their nearest hospitals or health centers.

Data management and Statistical analysis

Data management

The completed questionnaires and the signed consent forms for each participant, each bearing the unique identifier of the participant and the facility, were stapled together. They were all put in sealed envelopes by the researcher and locked up. Data was later entered using data entry templates SPSS version 24. Then the data was cleaned in preparation for analysis.

Statistical analysis

Comparisons between comorbid anxiety and depression and socio-demographic characteristics were examined using cross tabulation reporting chi-square/Fischer's exact tests. Multivariate analysis was performed by spontaneous selection of variables found to be significantly associated (P-value <0.05) at the bivariate level with comorbid anxiety and depression as covariates in the multivariate logistic regression, employing a 0.05 level of significance where the independent predictors were estimated

reporting adjusted Odds ratio and their 95% Confidence interval. All the analysis were conducted using SPSS version 23.

Results

A total of 172 participants completed the whole items in the EPDS, PHQ-4 and K10 questionnaires (response rate of 86 %) out of 186 who were found to be eligible for the study from 260 who consented to participate. As the number of incomplete data on the socio-demographic questions varied from one question to another, data were analyzed based on the complete information for the specific questions.

Socio-demographic and other characteristics of the respondents

Table 1 presents the socio-demographic characteristics of the respondents disaggregated by comorbid depression and anxiety. Majority of the participants (41.3%) were aged between 20-25 years followed by those aged 26-30 years (32.0%). Those aged 19 years and below and 36 and above represented the least proportion accounting for 6.4% and 5.8% respectively. Majority of the respondents (43.3%) had secondary level of education followed by 33.9% who had university/college level of education and 22.8% had primary level of education. More than three fourths of the participants (82.6%) were married. About 56.4% of the respondents were employed while the rest were unemployed. Majority of the participants (42.7%) had no income, while 21.1% earned above Ksh. 10,000 per month. Majority of the participants 53.2% had a partner who is employed while 46.8% were unemployed. About 76.7% of the participants had some form of partners support while 23.3% did not have any form of partners support. 9.6% of the participants had partners who abuses them either physically, emotionally or sexually. About 11.8% of the participants did not have support from the family and 65.9% of the pregnancies were planned. 11.7% of the participants were HIV positive. About 29% of the respondents indicated they had history of depressive symptoms during the pregnancy. 26.2% were had positive symptoms of psychological distress.

Proportions of comorbid depression and anxiety and psychological distress.

Table 2 presents the proportions of comorbid depression and anxiety and psychological distress and differences between the term and preterm mothers on those dimensions. The overall proportion postpartum depression as measured by EPDS (≥ 13) was 44.2%. Out of these 77.6% were mothers with pre-term babies. Similarly, out of 35.1% who screened positive for anxiety overall, 75% of them were mothers with pre-term babies. Out of the 26.2% of mothers with psychological distress 75.6% of them were mothers with pre-term babies. A total of 43 (25%) screened positive for comorbid depression and anxiety of these 83.7% were mothers with pre-term babies.

Factors associated with comorbid depression and anxiety

After controlling for all significant associations at bivariate level (Table 3) (i.e. gestational age, partners support, family support, IPV, pregnancy planned, history of depressed symptoms and psychological distress). The odds of poor psychological adjustment as measured on K10 was about six times more

among the mothers with pre-term birth as compared to those of term births (A.O.R=5.95; p=0.001), 4.76 times more (A.O.R=4.76; p=0.043) among mothers who reported intimate partner violence as compared to those who did not experience IPV. Those with comorbid depression and anxiety had six times more odds of having preterm births (A.O.R=5.75; p=0.002).

Discussion

Maternal PPD varies widely in different countries and regions worldwide due to different instrument measures, study design methods, sample sizes, timing and studied population(31–33). The objective of the study was to determine the prevalence of comorbid PPD and anxiety among mothers of preterm infants in NICU at KNH, compared to mothers of normal full-term infants at Umoja health center; using self-reported socio-demographic questionnaire, EPDS at cut off (≥ 13) Kessler 10 at a cutoff (≥ 20) and PHQ4 at a cutoff (≥ 3) screening instruments *Depression and anxiety in pre-term mother cohort and in full term mothers*

The prevalence of PPD in HICs has been estimated at 10% -15% and 0.5% - 60% in LMICs. In most African countries, it has been estimated at 0.7% -18%(34). In this study (see Table 2), using EPDS, K10 and PHQ4, the overall prevalence of PPD and anxiety in both groups of mothers was estimated at 25% for comorbid depression and anxiety, 44.2% for depression and 35.1% for anxiety. Our study finding was lower than that of Ethelwynn et al's study from South Africa that rated postpartum depression at 50.3% in their rural community health center sample. This study used EPDS (cutoff score was not indicated however) and BDI (with only severity proportions reported) (35). This study's higher scores may be explained by their design method, setting and timing, which are clearly different from the current study. Another study from Nigeria focusing on depression and anxiety in 270 postnatal women found 25.5% (n=69) of its sample with anxiety assessed using HAD-A (10). This study also found that it was history of depression (AOR = 0.12, 95% (CI 0.02, 0.76), and being a mother aged 15–29 years (AOR = 10.31, 95% (CI 1.13, 94.11) that had a significant effect on the development of anxiety symptoms in women..Our study results however were comparable to Muliira et. al's study conducted in rural Uganda, which found postpartum depression to be prevalent in 43 % of its sample. These authors once again used EPDS screening tool at cut off (≥ 10) on mothers attending child clinic from birth up to 12 weeks (36). The finding of the current study were also slightly lower than that of Yator et al.'s work which estimated postpartum depression at 48 % using EPDS cut off (≥ 11) (27). The reason for Yator et al.'s study higher rates may be explained by his study sample which was purely postnatal women living with HIV, unlike the current study sample (25). Overall, with some variations notwithstanding, the findings of this study concur with several studies conducted in some LMICs (12,13,31,34).

The prevalence of postpartum depression among NICU mothers in our study was estimated at 77.6% compared to the full-term group at 22.4%. The PPD rates of the comparison group was slightly higher than that of Ghubash & Abousaleh's study conducted in United Arab Emirates that estimated PPD of 17.3% among sample of postnatal Arab women (37). In another study from Nigeria by Owoeye et al which looked into postnatal risk factors, found postpartum depression at 23% which is closer to what we have

found in our comparison group of full term mothers(38). Owoeye's study was a cross sectional hospital based within the first week postnatal, however in the current study, which was clinic based for the comparison group was screened at six weeks postpartum.

In another study similar to ours, once again, carried out, in Nigeria by Ukpang et al. found that, the NICU mothers had psychological distress rated at 27.3% and postpartum depression at 15.1% compared to mothers of full term births; 3.7% of those had PPD (31). Ukpang et al's findings were lower than the current study findings. This may be explained by different screening tools used in this study (GHQ-30 and BDI). Similarly, Gulamani et al in their study in Pakistan found mothers of preterm infants had higher postpartum depression at 35.3% compared to mothers of full-term infants which were found to be 15.3% respectively. Gulamani et al's lower rates could be explained by the difference in geographical region where this study was conducted and also due to the study design. This was a cohort study with smaller preterm infants mothers' and larger full term infants mothers' sample sizes -clearly different that of the current study samples. Additionally, all their respondents were out-patients as this was a clinic based study (39).

The prevalence rate of psychological distress in both groups in the current study as measured by Kessler10 scale was estimated at 26.2%. The NICU preterm mothers had higher PPD and anxiety levels 77.6% (depression), 75% (anxiety) compared to 22.4% (depression) and 25% (anxiety) in the comparison group. The overall rates in this study was slightly lower that of Tesfaye et al's study based in Ethiopia where psychological distress was rated 29% using K10 scale. Tesfaye et al's findings were slightly higher that of the overall rates and of comparison group, but lower than that of NICU cases in this study. This difference could be explained by the methods used in his study (32) and higher risk factors associated with depression and anxiety in the NICU sample. Finally, comparing to another community-based sample from rural India by Prost et al (33) where K10 was used, the estimated prevalence of psychological distress was rated at 11.5%. This was close to that of the comparison group but much lower that of NICU cases and of the overall rates in the current study.

Risk factors for comorbid depression and anxiety in the overall sample

This study found that pre-term mothers had 5.75 times higher odds of developing depression and anxiety features than full term mothers. This could be explained by the fact that premature delivery almost always was sudden; the mothers were caught unawares and unprepared for child birth at that particular point in time. This study found that, a large number of mothers were destabilized by their preterm birth and majority of them were worried about the infant's survival. Studies have found that, preterm babies have a high mortality rate than normal full- term babies particularly in LMICs (20).

The study found that, most mothers were worried about prolonged mother – child separation. These findings with a mixture of other stressors such as frightening and unfamiliar NICU environment and settings, fragile unresponsive, small size looking infants in incubators, were indicated as triggers to psychological distress, anxiety and depression among NICU cases. These findings concur with several studies that found that stressful life experiences surrounding the preterm births, stressful NICU unfamiliar,

frightening settings, infants' small size, appearance and general condition predisposed to high levels of distress, anxiety and PPD in mothers (14,20,21,37,40).

Intimate Partner Violence

Intimate Partner Violence is a significant risk factor and several studies have documented the relationship between IPV and women's reproductive health, maternal health, mental health, and birth outcomes (41). There is significant evidence that in comparison to women who experienced IPV and those who did not, the prevalence of anxiety disorder and depressive disorder was high among IPV group (41,42). The exposure to IPV significantly increases the odds of PPD and anxiety (43). In another study, four out of ten women reported to have experienced adverse childhood experiences and two out of ten women reported IPV in the index pregnancy which was significantly associated with symptoms of postpartum depression (44). IPV experience is strongly and consistently associated with depression, including depressive symptoms and depressive disorders, and suicide in cross-sectional studies of women in both high- and lower-income settings.(45,46). Although it is easy to assume that IPV is causally related to subsequent depression and suicidal behavior, evidence suggests a more complex relationship. There are three modes of association, which are possible in any combination: (1) IPV exposure causes subsequent depression and suicide attempts, (2) depression and/or suicide attempts cause subsequent IPV, and (3) there are common risk factors for both IPV and depression and suicide attempts that explain the association between them.(45) There is also evidence that exposure to physical violence is associated with higher scores on the depression subscale ($\beta = 3.09, p = 0.005$), but not on anxiety subscale and that physical violence has a more direct association to PPD than psychological violence but these mechanisms have to be contextualized and better understood.

The type of violence and socioeconomic characteristics were more strongly associated with anxiety and depressive symptoms in women experiencing IPV than demographic variables (47)

Routine screening and interventions with adequate social protection mechanisms are crucial for reduction in IPV to make a lasting impact on maternal and neonatal well being.

Psychological distress

Perinatal period presents added psychosocial challenges to vulnerable women. There are several risk factors for development of anxiety and depression in perinatal period such as lack of partner or of social support; history of abuse or of domestic violence; personal history of mental illness; unplanned or unwanted pregnancy; adverse events in life and high perceived stress; present/past pregnancy complications; and pregnancy loss (24). In a study looking at specific demographics, maternal psychosocial and infant factors of mothers of very preterm infants at risk for postpartum depression or anxiety at the time of discharge from a level III urban Neonatal Intensive Care Unit (NICU), it was found that maternal factors, such as marital status, stress from parental role alteration and infant factors, such as prolonged ventilation, are associated with increased depression (24).

Multiple Risk Factors at Play

The current study found that there was not just one risk factor, but multiple factors contributed to the development of PPD and anxiety, particularly among the more vulnerable preterm births mothers. These were identified as (given in table 3):

- Preterm birth presents itself as a risk factor and predisposes the women to greater anxiety and depression
- Intimate partner violence was found to have contributed to 4.76 times higher odds of women developing depression and anxiety
- Psychological distress which could be due to several environmental factors could contribute to the two disorders and those with distress symptoms were 5.95 times more likely to develop depression and anxiety disorders speaks to the need for early screening and treatment.

Our work was not without its own limitations. Delays in data collection as a result of country wide doctors' and lecturers' industrial action in public hospitals and universities- in particular at KNH and Umoja health centre where the study was carried out- posed a considerable challenge. This study was hospital based for the preterm mothers who were also separated from their own families, compared to community based, for full term mothers (well mother baby clinic). The results of the study may be generalised as a true representation of the larger population only in the public hospitals with similar settings as KNH, because the pre-term mothers would be in hospital facilities for long periods. Self-reporting by the respondents may have over or under reported their true-self rating picture; however, the researcher was present all through at the time of data collection and she tried to ensure that the few participants who needed any clarification were helped in understanding the questions and purpose of the study.

Routine screening for depression and anxiety (psychological distress) for all mothers with preterm infants in NICU is recommended. The health care team (nurses, doctors and counselors) in Newborn Unit and in postnatal wards at KNH need to be sensitized around how to identify early signs of psychological disturbance among mothers of preterm infants in NICU. Routine group psychological counselling to NICU mothers soon after admission, and thereafter, to allay their fears and anxieties. NICU mothers to be afforded with sufficient rest in the wards, between the three hourly feeding program to take care of mental and physical drain. More research on postpartum depression, psychological distress and dissatisfactions among NICU mothers and follow up mother-infant outcome after discharge.

Conclusion

This study has found that postpartum depression and anxiety coexists. The mothers of preterm deliveries in NICU at KNH were at higher risk of postpartum depression and anxiety rated at (83.7%) compared to the comparison group (16.3%). Pre-term births, ongoing intimate partner violence and presence of psychological distress in women were risk factors found to play a significant role in development of

anxiety and depressive disorders. Stressful life events risk factors surrounding the delivery and the preterm birth in itself. We need routine screening to identify psychological distress in peripartum women and a special need to address mental health needs of preterm mothers with a keen eye on adverse exposures like intimate partner violence and existing psychological distress due to other perturba

Abbreviations

NICU: Neonatal Intensive Care Unit

EPDS: Edinburgh Postnatal Depression Scale

K10: Kesslers' 10

PTB: Preterm Births

ERC: Ethics and Review Committee

KNH: Kenyatta National Hospital

LMICs: Lower and Middle income Countries

MCH: Maternal and child health

PHQ-4: Patient Health Questionnaire-4

SSA: Sub-Saharan Africa

UoN: University of Nairobi

Declarations

Ethics approval and consent to participate:

The University of Nairobi/Kenyatta National Hospital Ethics Review Committee provided ethical approval for this study (P544/07/2016). All patients included in this study provided informed consent prior to participation in the study and gave consent for publication of the findings. Participants gave written informed consent and consented to their findings being published.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

The study was carried out by JM who drafted the concept, collected data and carried out initial analyses of her survey. MK was her primary mentor and helped in conceptualization, writing up and conducting multivariate analysis. PK was her second supervisor who assisted during planning of the research concept and reviewed the MS, PN was her third supervisor who assisted in refining the study and reviewing the paper for submission. AT assisted with statistical analyses. All authors read and approved the manuscript.

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Consent to publish

Informed consent was given from participants in this research for future uses of data, such as publication, preservation and long-term use of research data. Confidentiality was assured. The information collected was kept confident, serial numbers was used instead of names.

Availability of materials

Deidentified data file would be made available upon reasonable request to the corresponding author

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Tables

Table 1: Sample Characteristics (N=172)

Characteristic	Category	Overall n(%)	Co-Morbid Anxiety and Depression		Group Differences
			No	Yes	
Gestational Age	Term	86(50.0%)	79(91.9%)	7(8.1%)	$\chi^2=26.1$; $p<0.001$
	Preterm	86(50.0%)	50(58.1%)	36(41.9%)	
Age in Years	19 and below	11(6.4%)	8(72.7%)	3(27.3%)	$\chi^2=4.5$; $p=0.342$
	20-25Years	71(41.3%)	53(74.6%)	18(25.4%)	
	26-30Years	55(32.0%)	42(76.4%)	13(23.6%)	
	31-35Years	25(14.5%)	21(84.0%)	4(16.0%)	
	36 and above	10(5.8%)	5(50.0%)	5(50.0%)	
Education level	Primary	39(22.8%)	24(61.5%)	15(38.5%)	$\chi^2=5.0$; $p=0.081$
	Secondary	74(43.3%)	57(77.0%)	17(23.0%)	
	Tertiary	58(33.9%)	47(81.0%)	11(19.0%)	
	<i>Missing</i>	1			
Marital Status	Married	142(82.6%)	106(74.6%)	36(25.4%)	$\chi^2=0.1$; $p=0.817$
	Single	30(17.4%)	23(76.7%)	7(23.3%)	
Occupation	Unemployed	75(43.6%)	52(69.3%)	23(30.7%)	$\chi^2=2.3$; $p=0.131$
	Employed	97(56.4%)	77(79.4%)	20(20.6%)	
Income	No Income	73(42.7%)	51(69.9%)	22(30.1%)	$\chi^2=7.3$; $p=0.063$
	1000-5000	38(22.2%)	25(65.8%)	13(34.2%)	
	5001-10000	24(14.0%)	20(83.3%)	4(16.7%)	
	Above 10,000	36(21.1%)	32(88.9%)	4(11.1%)	
	<i>Missing</i>	1			
Partner Employed	Yes	91(53.2%)	73(80.2%)	18(19.8%)	$\chi^2=3.0$; $p=0.085$
	No	80(46.8%)	55(68.8%)	25(31.3%)	
	<i>Missing</i>	1			
Partners' support	No	40(23.3%)	24(60.0%)	16(40.0%)	$\chi^2=6.3$; $p=0.012$
	Yes	132(76.7%)	105(79.5%)	27(20.5%)	
Family support	No	20(11.8%)	8(40.0%)	12(60.0%)	$\chi^2=14.4$; $p=$ <0.001
	Yes	150(88.2%)	119(79.3%)	31(20.7%)	
	<i>Missing</i>	2			
Intimate Partner violence	Yes	16(9.6%)	5(31.3%)	11(68.8%)	$\chi^2=18.5$; $p=$ <0.001
	No	150(90.4%)	120(80.0%)	30(20.0%)	
	<i>Missing</i>	6			
Pregnancy planned	Not planned	58(34.1%)	36(62.1%)	22(37.9%)	$\chi^2=7.4$; $p=0.006$
	Planned	112(65.9%)	91(81.3%)	21(18.8%)	
	<i>Missing</i>	2			
HIV status	Positive	20(11.7%)	12(60.0%)	8(40.0%)	$\chi^2=2.9$; $p=0.088$
	Negative	151(88.3%)	117(77.5%)	34(22.5%)	
	<i>Missing</i>	1			
History of depressed symptoms	Yes	49(28.7%)	28(57.1%)	21(42.9%)	$\chi^2=11.4$; $p=0.001$
	No	122(71.3%)	100(82.0%)	22(18.0%)	
	<i>Missing</i>	1			
Psychological Distress	No	127(73.8%)	111(87.4%)	16(12.6%)	$\chi^2=39.8$; $p<0.001$
	Yes	45(26.2%)	18(40.0%)	27(60.0%)	

Table 2: Psychological Comparisons between mothers with preterm babies and those with term babies.

Measure	Overall (N=172)	Term Mothers (n=86)	Pre-Term Mothers (n=86)	Sig.
Comorbid Anxiety and Depression	43(25.0%)	7(16.3%)	36(83.7%)	p<0.001
Depression (EPDS≥13)	76(44.2%)	17(22.4%)	59(77.6%)	p<0.001
Anxiety (PHQ-4)	60(35.1%)	15(25.0%)	45(75.0%)	p<0.001
Psychological Distress (K10)	45(26.2%)	11(24.4%)	34(75.6%)	p<0.001

Table 3: Factors associated with co-morbid Depression and Anxiety

Characteristic	Category	A.O.R.	95% C.I.		Sig.
			Lower	Upper	
Gestational Age	Term	Ref.			
	Preterm	5.75	1.93	17.14	0.002
Partners' support	No	1.15	0.36	3.60	0.816
	Yes	Ref.			
Family support	No	2.06	0.54	7.93	0.292
	Yes	Ref.			
Intimate Partner violence	Yes	4.76	1.05	21.59	0.043
	No	Ref.			
Pregnancy planned	Not planned	1.20	0.44	3.26	0.718
	Planned	Ref.			
History of depressed symptoms	Yes	1.57	0.58	4.25	0.379
	No				
Psychological Distress	No	Ref.			
	Yes	5.95	2.25	15.71	<0.001

Note: A.O.R-Adjusted Odds Ratio; C.I-Confidence Interval; Ref.-Reference Category