ORIGINAL ARTICLE

Prevalence of Anxiety and its Severity among Mothers of Critically Ill Newborns

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Abstract

Background: The admission of newborns to neonatal units is distressing for parents especially for mothers as the physical environment in the neonatal intensive care unit (NICU) is considered to be a major source of anxiety for mothers of infants admitted there.

Objective: To determine the prevalence of anxiety and its severity among mothers of critically ill newborns.

Methods: This cross-sectional study was performed at the National Institute of Child Health Karachi, Pakistan, from January to June 2024. The perinatal anxiety screening scale (PASS) was used to screen mothers with anxiety. Anxiety screening will be summarized as asymptomatic, mild-moderate, and severe for scores of 0-20, 21-41, and 42-93, respectively.

Results: A total of 250 mothers were enrolled in the study with a mean age of 25 ± 3.7 years. The mean score for PSS was 20 ± 11. Out of 250 mothers, 50% were asymptomatic, 47.6% had mild to moderate anxiety and 2.4% had severe anxiety. None of the patients' features including their age, education, parity, and pregnancy planning were found to be associated with anxiety except preterm birth with a significantly higher frequency of anxiety among mothers of preterm than those who were normal (79.4% *versus* 40.1%, p<0.001).

Conclusion: The present study demonstrated that half of the mothers of admitted neonates were having anxiety issues. Preterm birth was seen as a crucial factor for a higher-anxiety mother. For timely addressing anxiety issues, the treating consultant and present duty staff should be educating and counseling mothers from time to time regarding hospital protocols necessary to maintain NICU care.

Keywords: *Perinatal anxiety screening scale, mental health, cross-sectional study, neonatal intensive care unit, Karachi.*

INTRODUCTION

Parents are distressed when their newborn is admitted to the neonatal unit, especially the mothers [1]. Family caregivers actively participate in various aspects of their child's care during a chronic illness, especially in pediatrics. This includes helping with the biological, physical, rehabilitative, psychological, family, social, and institutional health domains. Furthermore, long-term treatments, managing the social, economic, and emotional obstacles associated with chronic diseases, and the coordination of the delivery of health services are all directly under the purview of caregivers. To give patients who are chronically sick the care they require, these obligations must be fulfilled [2, 3]. In addition to being afraid for their child's life and health, parents also have to worry about being away from their child, being in a strange and possibly overwhelming setting, and possibly having trouble finding information and interacting with personnel [4].

The process of giving birth to a baby requiring NICU care is widely regarded as a life crisis. The admission to the neonatal unit increases the mother's concerns in such a situation [5]. There is a need for time to provide family-centered care because parents of newborns brought to the NICU are under a lot of stress. Mothers of newborns admitted to the neonatal intensive care unit (NICU) are thought to experience significant anxiety due to the physical atmosphere of the facility. Mothers may experience fear due to the bright lights utilized in many NICUs, the noise made by life support equipment, and the sirens on ventilators and monitors [6]. Both parents' psychological well-being may be impacted by these normal developmental crises of transitioning to parenting, especially if their newborn is admitted to the NICU. Both the newborn's mother and father experience stress when their child is admitted to the NICU. Given that they are also dealing with other prenatal stressors, moms in particular may be under more stress in such vulnerable circumstances than fathers [7]. Furthermore, staff members' capacity to adequately attend to parents' demands is frequently impeded by time constraints. Parental complaints are frequently caused by the neonatal staff's lack of informative and consistent communication [8].

In the early postpartum phase, the mother-child relationship is crucial because it allows mothers to experience the joys and satisfaction of parenting just like any other new mother. The correlation between maternal mental health and infant developmental outcomes, such as delayed cognitive development, early breastfeeding cessation, and impaired bonding, highlights the necessity of treating psychiatric symptoms

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in mothers at an early stage to enhance maternal-infant attachment and engagement and thereby promote infant well-being [9].

Mothers in particular experienced emotional disruptions when their newborns were admitted to the NICU because of having a sick child, worrying about losing their child, and not being able to fulfill the expectations of traditional parenting. Furthermore, when parents witness their infants in an unfamiliar incubator or linked to a monitor, unpleasant feelings also surface and exacerbate their mental discomfort. Stress brought on by a baby's NICU hospitalization and being taken away from parents can be detrimental to parents' mental health and wellness. It has been linked to anxiety, exhaustion, sadness, and disturbed sleep. There are other comparable researches on this topic accessible from various nations [10-12]. Local data is hard to come by, though [13]. Furthermore, our local healthcare system differs greatly from those of other nations. Moms' anxiety levels may be raised by the absence of a comfortable place where they can tend to their baby's needs, such as feeding and drinking, inadequate information about the baby's condition, a lack of communication with healthcare providers because of work overload, abstaining from baby care, and a lack of social support. Therefore, there is the utmost need to determine the prevalence of anxiety and severity among mothers of critically ill newborns in our local population, for which this study was planned.

MATERIALS AND METHODS

With approval from the Institutional Review Board (IRB#: IERB-56/2022), this cross-sectional study was carried out in the NICU of the National Institute of Child Health, Karachi, Pakistan. The study was performed from January to June 2024. This study included mothers of newborns admitted to the NICU. This study did not include moms of newborns with birth defects that are not compatible with life, unwell mothers, mothers with mental health diagnoses, mothers taking antidepressants, and mothers who chose not to participate.

A sample size of 246 was calculated based on a 20% frequency of anxiety among mothers [14] in a previous study using a 95% confidence interval and a 5% margin of error. Computation was performed on an Open-Epi online calculator. Study participants were enrolled using the prenatal anxiety screening scale (PASS) was used to measure maternal anxiety. A 31-item self-report test called the PASS is used to examine pregnant and postpartum women for problematic anxiety. The interviewer rates each item on the PASS on a 4-point scale that is summarized based on how severe it was during the previous month. The score is between 0 and 93. Anxiety screening was graded as asymptomatic, mild-moderate, and severe for a score range of 0-20, 21-41, and 42-93, respectively. With a Cronbach's α of 0.96, the PASS exhibits exceptional reliability and has been approved for use in hospital, mental health, and community samples [15]. Neonates delivered before 37 weeks of pregnancy were considered preterm [16]. Mothers of neonates admitted to the NICU for at least 12 hours were interviewed by trainee doctors to screen them for anxiety using PASS and record their socio-demographic data. Preterm history was taken from the medical record file.

Data was entered in SPSS version 26 to perform statistical analysis. Categorical variables were expressed as frequency and percentages. Numerical variables were summarized as mean ± standard deviation. Participants were grouped as asymptomatic and having anxiety. Then the frequency of maternal' features was compared among those who were asymptomatic and having anxiety using the Chi-square of the Fisher-exact test. A P-value ≤0.05 was taken as statistically significant.

RESULTS

A total of 250 mothers were enrolled in the study. The mean age of patients was 25 ± 3.7 years. Few of mothers were illiterate (9.2%). Most of the females were primiparous (61.2%) and had planned pregnancy (82.4%). Table **1** displays the socio-demographic features of study participants.

The mean score for PSS was 20 ± 11. Out of 250 mothers, 50% were asymptomatic, 47.6% had mild to moderate anxiety, and 2.4% had severe anxiety. Table **2** displays comparisons of patients' features among asymptomatic mothers and mothers with mild to severe anxiety. None of the patients' features, including their age, education, parity, and pregnancy planning, were found to be associated with anxiety except preterm birth, with a

Table 1: Socio-demographic features of study participants.

Variables	Frequency (%)
Age groups	
18-20 years	26(10.4)
21-25 years	110(44)
26-30 years	94(37.6)
30 years and above	20(8)
Education	
Illiterate	23(9.2)
Primary pass	16(6.4)
Secondary Class	8(3.2)
Matriculation	85(34)
Intermediate	80(32)
Graduation or above	38(15.2)
Parity	
Primi-parous	153(61.2)
Second	72(28.8)
Third	25(10)
Planned pregnancy	
Yes	206(82.4)
No	44(17.6)
Preterm	
Yes	63(25.2)
No	187(74.8)

Table 2: Comparison of patients' features among asymptomatic mothers and mothers with mild to severe anxiety.

Variables	Groups	Anxiety		p-values
		Asymptomatic n(%)	Mild to Severe n(%)	
Age	18-20 years	12(46.2)	14(53.8)	0.767
	21-25 years	53(48.2)	57(51.8)	
	26-30 years	48(51.1)	46(48.9)	
	30 years and above	12(60)	8(40)	
Education	Illiterate	12(52.2)	11(47.8)	0.807
	Primary pass	7(43.8)	9(56.3)	
	Secondary Class	3(37.5)	5(62.5)	
	Matriculation	44(51.8)	41(48.2)	
	Intermediate	43(53.8)	37(46.3)	
	Graduation or above	16(42.1)	22(57.9)	
Parity	Primi-parous	75(49)	78(51)	0.632
	Second	39(54.2)	33(45.8)	
	Multiple	11(44)	14(56)	
Pregnancy planning	planned	104(50.5)	102(49.5)	0.740
	unplanned	21(47.7)	23(52.3)	
Preterm birth	Yes	13(20.6)	50(79.4)	<0.001
	No	112(59.9)	75(40.1)	

significantly higher frequency of anxiety among mothers of preterm than those who were normal (79.4% *versus* 40.1%, p<0.001).

DISCUSSION

The present study demonstrated that out of 250 mothers, 50% were asymptomatic, 47.6% had mild to moderate anxiety, and 2.4% had severe anxiety, contributing to the overall anxiety prevalence in almost half of the studied sample. In contrast to our study, another study from Pakistan performed in Lahore showed a lower prevalence of anxiety (28.1%) [13]. The studies performed around the globe depicted variations in anxiety prevalence among mothers of neonates admitted to the NICU [10, 12, 17-19]. An Indian study performed a similar study and formed two groups of mothers of preterm and full-term neonates and found the prevalence of anxiety was 87.1% and 67.7% among mothers of preterm and full-term neonates who were admitted to the NICU, showing that both groups had a higher prevalence than our study [10]. A similar survey from Egypt reported that 12.0% of pregnant women had mild levels of anxiety, 75.0% of them had a moderate level of anxiety, and 13.0% had severe anxiety levels during pregnancy [17]. Nearly a quarter of expectant mothers were found to have anxiety (28.1%) in a study from Malaysia [12]. A study from Brazil depicted a very high prevalence of 93.4% for severe anxiety among mothers of NICU-admitted neonates [18]. A meta-analysis analyzing 21 anxiety-related studies reported a pooled prevalence of 41.9% (95% CI: 30.9, 53.0) among parents, which is comparable to our study [19].

The variation among studies is explicable due to nationwide cultural differences and differences in healthcare structure impacting service delivery of NICUs across the globe. A noticeable point is the huge difference in prevalence among the two Pakistani studies. We believe that our study was performed in a public sector institution where infrastructure is quite different in contrast to the private sector institutions in terms of communication, resources, and patient care processes, whereas another study was performed in a private sector institute, which might result in a huge prevalence difference.

Generally, it is a concept that biological aging and anxiety have a positive correlation. However, in the case of perinatal anxiety, it was seen that younger mothers are more prone to exhibit anxiety disorder than older females [20, 21]. It was demonstrated in a study that a mother of adolescent age has a chance of 10.31 times for prenatal distress compared to a mother of adult age [22]. Likewise, studies investigating anxiety in mothers of neonates admitted to the NICU also reported that anxiety was more prevalent in younger mothers than older mothers [10, 13, 17]. However, our findings do not corroborate with existing literature, as we did not find a significant association of maternal age with perinatal anxiety in this study. The fact that anxiety was prevalent among half of the studied sample and the limited sample size may have contributed to this conflicting finding.

Through a variety of processes, including increased access to resources like fulfilling employment, stable finances, richer social networks, higher socioeconomic status, healthier lifestyles, and healthcare, education attainment may be protective against mental disorders [22]. Gard D *et al.* [10] demonstrated that the likelihood of anxiety was lower in illiterate and higher-educated mothers and higher in mothers with primary and secondary schooling. Gul *et al.* [13] reported the frequency of anxiety was directly related to maternal education. de Souza LG [18] demonstrated that parental education level was significantly negatively correlated with anxiety among mothers of neonates in the NICU. The findings of the present did not align with the findings of previous existing literature, as we did not find significant differences in anxiety prevalence based on education.

Psychological problems are often reported in primipara mothers rather than multipara [23]. The fear of pain at the time of childbirth and the responsibility handling of newborn babies expose primiparous mothers to multiple mental health issues such as depression and anxiety [23, 24]. Although previous studies have reported a higher mental health burden, including depression and anxiety, among primiparous mothers [23, 24], our study did not find a difference in anxiety prevalence in terms of parity. An unplanned pregnancy can play a role as a stressor for mothers for deteriorating their mental health because of managing resources and expenses and dealing with

their health issues from unintentional pregnancy [25, 26]. In such circumstances, admission to the NICU not only brings financial crises but also compromises mother-and-nephew interaction, which may lead to higher anxiety levels. Nevertheless, we did not find such an impact in this study. Another substantial factor contributing to anxiety is the preterm birth of a baby. In this study, the only factor impacting the likelihood of maternal anxiety is a preterm baby birth, which is consistently reported in existing literature [13, 27].

The present study was performed in a single public sector institution in Karachi with a limited sample size. Secondly, in this study, we did not include the impact of pregnancy-associated complications, mode of delivery, and/or any other preexisting maternal comorbidity. NICU staff knowledge could also be explored for dealing with mothers having perinatal anxiety. These gaps limit the generalization of study findings for the local population in Karachi. To address the gap of the present study, a study with a larger sample size should be performed, exploring the differences between public and private sector institutions as well.

CONCLUSION

The present study demonstrated that half of the mothers of admitted neonates were having anxiety issues. Preterm birth was seen as a crucial factor for a higher-anxiety mother. For timely addressing anxiety issues, the treating consultant and present duty staff should be educating and counseling mothers from time to time regarding hospital protocols necessary to maintain NICU care.

ETHICS APPROVAL

The study was commenced after acquiring ethical approval from Institutional Review Board (IRB#: IERB-56/2022). Since the study was retrospective, so consent was essential to take from study subjects. The study was performed in accordance with the national legislation and institutional requirements and the Declaration of Helsinki, 2013.

CONSENT FOR PUBLICATION

Written informed consent was taken from the participants.

AVAILABILITY OF DATA

The dataset utilized in this manuscript will be available from the corresponding author upon a reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Declared none.

AUTHORS' CONTRIBUTION

ZS conceptualized the study. ZS & MK performed the literature search and prepared the study protocol. HU &AM gathered the data, performed data entry, analysis and interpreted the results. ZS& MS were involved in the initial manuscript drafting. MK critically reviewed and revised and initial manuscript draft. All authors read and approved the manuscript.

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