

Research Article

Stress and Coping Strategies among Mothers with Preterm babies admitted in NICU- A Descriptive Correlational Study from South India

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A B S T R A C T

Background: Mothers of newborns admitted to NICU have reported a loss of control over a vital life event. This stress may be aggravated by the child's appearance, difficult medical technologies, use of medical equipment, and fear of newborn death. When the baby is born preterm with complications, parents undergo severe mental stress and experience heightened distress, including increased anxiety, depression, and trauma symptoms, compared with parents of healthy infants when their child is admitted to a Neonatal Intensive Care Unit (NICU).

Aim: To assess the stress and coping strategies among mothers of preterm babies admitted to the NICU.

Methods: A quantitative research approach with a non-experimental descriptive correlational design was adopted to study stress and coping strategies among mothers with preterm babies. Seventy mothers with preterm babies admitted to the NICU at a selected tertiary hospital, Karnataka were selected by convenience sampling technique. The standardised Parental Stress Scale (PSS), and Brief Cope Scale (BCS) were used for collecting the data regarding stress and coping strategies among mothers of preterm babies.

Results: The data were analysed with descriptive statistics for a description of sample characteristics and research variables and inferential statistics like Pearson correlation for correlation. Results revealed that the majority of the mothers (82.8%) had higher stress, and the most (51.4%) of them employed moderate coping strategies. Stress and coping strategies had shown a significantly high negative correlation to support the existence of an inverse relationship between them.

Conclusion: The study concluded that stress and coping strategies among mothers of preterm babies admitted to the NICU are measurable constructs, and both were found to be negatively correlated. Most of the mothers had higher levels of stress, and the majority of them were using moderate levels of coping strategies to overcome the stressful situations.

Keywords: Stress, Coping, Coping Behaviour, Preterm mothers, Preterm babies

Introduction

According to WHO Preterm birth is defined as babies born alive before 37 weeks of pregnancy are completed is are called preterm birth.^{1,2} As reported by WHO, over 13.4 million babies were born prematurely in 2020. That equates to more than one in every ten newborns. In 2019, over 9,000,000 children perished as a result of preterm birth problems. Many survivors face lifelong difficulties, including learning disorders and, vision and hearing problems.²

Preterm neonates, especially those born very prematurely, are indeed at higher risk for various complications, including neurodevelopmental issues. Factors such as immaturity of organs, including the brain, and exposure to medical interventions can contribute to these risks. The severity of prematurity often correlates with the likelihood and severity of neurodevelopmental problems later in life. These can include cognitive, motor, sensory, and behavioral challenges. It underscores the importance of closely monitoring and providing appropriate care for preterm infants to mitigate these risks as much as possible.³

The experience of having a baby born preterm with complications and admitted to a Neonatal Intensive Care Unit (NICU) is profoundly challenging for parents, leading to severe mental stress and heightened distress. Unlike parents of healthy infants, whose entry into parenthood is often marked by joy and anticipation, parents of preterm infants are thrust into a world of uncertainty and fear from the moment of birth. Witnessing their newborn struggle for survival in the NICU, surrounded by medical equipment and receiving intensive care, can evoke feelings of helplessness and despair. The NICU environment, with its beeping monitors and sterile surroundings, serves as a constant reminder of the fragile state of their child's health, exacerbating parental anxiety and distress.⁴ However, the unexpected crisis that results from giving birth to a child with a critical illness is caused by the fact that preterm birth-related complications have been reported to be the world's leading cause of death, surpassing pneumonia as the leading cause of death in both the neonatal period and the under-5 mortality worldwide,⁵ and it was also noted that mothers had higher levels of stress than the fathers if the preterm babies are treated in NICU.^{6,7}

Every year, 3,341,000 premature babies are born in India, and of these, 3,61,600 preterm children die before they turn five as a direct result of complications,⁸ and the preterm baby's admission rate increased from 64 to - 77.9 per 1000 live births during the last 6 years of the study.⁵

The arrival of a new baby is a joyous time, but it also causes stress for each parent, partner, and family. The new member disrupts established balances and places pressures

on its members to adjust to new parenting duties. In the NICU setting, parents may feel their parental role limited as a result of professionals and regulations controlling interactions between parents and their newborns.³

Anxiety, rage, depression, and post-traumatic stress disorder are common reactions that parents experience when faced with uncertainties about their child's survival, separation from it, prolonged hospital stays, and long-term consequences of prematurity.³ The level of stress and anxiety that parents encounter varies over time and among individuals. In addition to the stressors associated with the typical transition process to parenthood, mothers of newborns in a neonatal intensive care unit (NICU) particularly experience multiple stressors related to preterm birth, the baby's medical condition, the complexity of the NICU environment, and the infant's perceived vulnerability.⁹

Measuring parents' stress levels and pinpointing the biggest environmental stressor by analysing the aspects of a baby's parents and surroundings that can be stressful may help healthcare providers recognize the value of these relationships and provide better treatment.⁸

The state of their newborns and the assistance they receive from significant others considerably influence the coping mechanisms of mothers of preterm babies, despite the fact that they handle the situation differently after giving birth. These strategies include praying, bonding to with the baby, and acceptance of the situation.¹⁰

Most of the Indian studies have been carried out to assess the stress of mothers with preterm babies admitted in to the NICU, but there were few studies which focusedes on the coping strategies. Thus, the researcher felt the need to conduct a study on stress and coping strategies of mothers of preterm babies admitted in NICU. The present descriptive correlation study was conducted to fill this gap in the literature and understand the existence of stress and coping strategies and their relationship between them among the mothers with preterm babies admitted in to the NICU to devise better strategies to overcome such issues in the future, which can minimize the number of unforeseen consequences in this population.

Materials and Methods

A descriptive correlation study to assess the stress and coping strategies among mothers with preterm babies admitted to the NICU at a selected tertiary hospital, Karnataka was conducted with a duration of four weeks of data collection to meet the following primary objectives; to assess stress and coping strategies, to determine the relationship between stress and coping strategies among mothers with preterm babies, and with a secondary objective of the analytical aspect to find out the association of stress and coping with sample characteristics. After

obtaining administrative and ethical approval from the Institutional Research and Ethics Committee, permission was obtained from the concerned authorities of the hospital to collect the data. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines/checklist was adopted for reporting the present research.

A quantitative research approach with the non-experimental descriptive correlation design was adopted to conduct the study among a total of 70 mothers with preterm babies admitted to the NICU at selected tertiary Hospital, Karnataka by convenience sampling technique. The sample size was ensured from the estimation of effect size for correlational studies based on the previous study results which revealed a moderate effect size for the correlation between stress and coping ($r=-0.308$).¹¹ Power analysis using G*Power 3.1.9.4 (Erdfelder, Faul & Buchner, 1996) revealed that for a moderate effect ($r=-0.308$) at the 5% significance level with the power of 80%, at least 63 participants are needed for the current study. To allow sufficient buffer for dropouts and missing data, 70 mothers with preterm babies were recruited. The study included mothers with preterm babies admitted to the NICU, and mothers who were willing to participate, whereas the study excluded mothers who were known cases of mental illness, like depression and anxiety, and those who were critically ill, and were not available during data collection. Mothers with preterm babies admitted to the NICU were included in the study after obtaining written consent from them. The participant information sheet was provided with detailed information, and confidentiality was assured. The study was carried out by the guidelines laid down by the Indian Council of Medical Research (2017).

The sample characteristics proforma was used to collect the data regarding socio-demographic variables, using self-report (interview) technique with record analysis, and the standardised Parental Stress Scale (PSS), and Brief Cope Scale (BCS) were used for collecting the data regarding stress and coping strategies among mothers of preterm babies using self-report (interview) technique. Tools were validated by research experts and the internal consistency reliability of Cronbach's alpha for the translated versions of both standardised scales was ensured before the data collection and found to be acceptable. After obtaining consent from the mothers, they were administered data collection instruments to assess the level of stress and coping strategies.

Data analysis

The normality of the data was tested with the Shapiro-Wilk test and found both stress and coping were normally distributed. Hence, the parametric test was applied to test the hypotheses at a 0.05 level of significance, and the confidence interval was set at 95%. Descriptive statistics

such as frequency and percentage were used to describe the sample characteristics, and level of stress and coping strategies. Inferential statistics such as Pearson correlation were used to test the correlation between stress and coping strategies, and the chi square test to test the association of stress and coping with selected sample characteristics. Data was analysed using statistical package software for social sciences (SPSS) version 21.

Results

Description of sample characteristics

The frequency and percentage distribution of mothers with preterm babies admitted to NICU about socio-demographic variables showed that the majority 36 (51.4%) were in the age group between 27 and 35 years, and most of the mothers 43 (61.4%) were graduated. The majority of the mothers with pre-term babies 45 (64.3%) were home maker and with respect to the family income, most of the mother's 30 (42.8%) were had a family income of less than Rs. 25,000 month. The majority of the mothers, 35 (50%), were from nuclear families, most of the mothers 52 (74.3%) were staying in urban areas, most of the mothers had a single child 49(70%), and most of the babies 47 (67.1%) had a first birth order. Further, less than half of mothers 58 (82.8%) have a history of previous NICU admission for another child in the past and more than half of the mothers 54 (77.2%) got a support system during hospitalisation. In terms of mode of delivery, most of the delivery 33 (47.1%) had been delivered through scheduled caesarean and unplanned caesarean, and most of the mother's, 62 (85.7%) don't have a history of previous loss of a child 62(85.7%). The majority of the mother 58 (82.8%) did not have any comorbidities and pregnancy associated illnesses, and also there was no history of any chronic illness among previous children.

With regard to baby related sociodemographic variables, the majority of the children 32 (45.7%) were at the gestational age of 25-30 weeks and also 31-35 weeks. On considering the weight of the baby, most of the preterm babies 21 (30%) belonged to the weight of less than 1000 gm and also between the 1001 and 1500 gm. With regard to the duration of hospitalisation, the majority of the preterm babies 36 (51.4%) were admitted for less than 10 days, and most of the preterm babies, 58 (82.8%) had no illness (Table 1).

Description of Stress and Coping strategies among Mothers with Preterm babies

The frequency and percentage distribution were calculated and reported for research variables. In terms of level of stress, the majority of the mothers with preterm babies 58 (82.8%) reported a high level of stress whereas the least number of subjects 12 (17.2%) experienced low stress, with

the overall mean percentage of stress reported as 64.51%. The level of stress was categorised as low stress (0-49.9%) and high stress ($\geq 50\%$). In terms of coping strategies used by the mothers with preterm babies, most of the mothers 36 (51.4%) had demonstrated a moderate level of coping strategies. The level of coping was categorised as low (0-33.3%), moderate (33.4-66.7%) and high coping ($>66.7\%$) (Table 2).

Correlation between Stress and Coping strategies among Mothers with Preterm babies

Pearson correlation between stress and coping strategies revealed that there was a significant high negative correlation between stress and coping ($r=-0.713$, $p<0.001$) among mothers with preterm babies at the 0.05 level of significance, which infers that an increase in the score of stress would result in a decreased coping score and vice versa with the strong inverse relationship (Table 3).

Table 1. Descriptive output of Sample characteristics (Socio-demographic variables) and their association with Stress and Coping among Mothers with Preterm babies

N=70

Variables	n (%)	Level of Stress			Level of Coping		
		χ^2	df	p-value	χ^2	df	p-value
Age in Years							
18-26 yrs.	24 (34.3)	13.678	2	0.001**	14.075	4	0.007**
27-35 yrs.	36 (51.4)						
36-45 yrs.	10 (14.3)						
Educational Status							
Primary	10 (14.3)	16.756	2	<0.001***	18.663	4	0.001**
Higher Secondary	17 (24.3)						
Graduation and above	43 (61.4)						
Occupation							
Homemaker	45 (64.3)	4.489	2	0.106 ^{NS}	11.527	4	0.020*
Government Employee	6 (8.6)						
Private Employee	19 (27.1)						
Monthly Family Income							
Below Rs.25000	30 (42.8)	6.638	3	0.084 ^{NS}	16.502	6	0.011*
Rs. 25000-Rs. 50,000	20 (28.6)						
Rs. 50,001-Rs 100,000	9 (12.8)						
More than 1,00,000	11 (15.8)						
Type of Family							
Joint family	35 (50.0)	0.000	1	1.000 ^{NS}	2.636	2	0.268 ^{NS}
Nuclear family	35 (50.0)						
Place of Residence							
Rural	14 (20.0)	5.013	2	0.082 ^{NS}	52.867	4	<0.001***
Urban	52 (74.3)						
Suburban	4 (5.7)						
Number of Children							
1 Child	49 (70.0)	2.759	1	0.097 ^{NS}	3.754	2	0.163 ^{NS}
2 Children	21 (30.0)						

Birth Order of Neonate							
One	49 (70.0)	1.929	1	0.165 ^{NS}	1.996	2	0.369 ^{NS}
Two	21 (30.0)						
History of NICU admission of another child							
Yes	12 (17.2)	2.996	1	0.083 ^{NS}	4.078	2	0.130 ^{NS}
No	58 (82.8)						
Support System during Hospitalization							
Yes	54 (77.1)	4.291	1	0.038*	19.588	2	<0.001***
No	16 (22.8)						
Mode of Delivery							
Normal vaginal delivery	4 (5.8)	16.238	2	<0.001***	35.814	4	<0.001***
Scheduled Cesarean	33 (47.1)						
Unplanned cesarean	33 (47.1)						
Previous History for Loss of Child							
Yes	8 (14.3)	1.869	1	0.172 ^{NS}	19.707	1	<0.001***
No	62 (85.7)						
Co-morbidities and Pregnancy Associated Illness							
No	58 (82.8)	11.008	1	0.001**	18.158	2	<0.001***
Yes	12 (17.2)						
Any chronic illness among Previous Children							
No	70 (100)	NA			NA		
Gestational Age of the Baby							
25-30 weeks	32 (45.7)	35.679	2	<0.001***	40.458	4	<0.001***
31-35 weeks	32 (45.7)						
More than 35 weeks	6 (8.6)						
Weight of the Baby							
Less than 1000 gm	21 (30.0)	22.931	3	<0.001***	39.294	6	<0.001***
1001-1500 gm	21 (30.0)						
1501-2000 gm	18 (25.7)						
2001-2500 gm	10 (14.3)						
Duration of Hospital Stay							
Less than 10 days	36 (51.4)	3.118	2	0.210 ^{NS}	30.915	4	<0.001***
10-20 days	24 (34.3)						
More than 20 days	10 (14.3)						
Preterm associated Illness							
Yes	12 (17.2)	11.008	1	0.001**	18.158	2	<0.001***
No	58 (82.8)						

*, **, ***= p- Significant at 0.05, 0.01, and 0.001 level

NS=Non-significant

χ^2 = Chi-square

Table 2. Level of Stress and Coping strategies among Mothers with Preterm babies

N=70

Variables	Level	Frequency (%)
Stress	High Stress (55-90)	58 (82.8)
	Low Stress (18-54)	12 (17.2)
Coping	High Coping (85-112)	22 (31.4)
	Moderate Coping (56-84)	36 (51.4)
	Low Coping (28-55)	12 (17.1)

Table 3. Pearson Correlation between Stress and Coping strategies among Mothers with Preterm babies

N=70

Variables	Stress	Coping
	r (p-value)	r (p-value)
Stress	1	-0.713***(<0.001)
Coping		1

*, **, ***= p- Significant at 0.05, 0.01 & 0.001 level r(68)=0.235

Association of stress and coping strategies with selected sample characteristics

The association of stress and coping strategies with selected socio-demographic variables was calculated by Chi-Square test. The results revealed with regard to stress that it was found to be significantly associated with socio-demographic variables like age in years ($\chi^2=13.678$, $p=0.001$), educational status ($\chi^2=16.756$, $p<0.001$), support system during hospitalisation ($\chi^2=4.291$, $p=0.038$), mode of delivery ($\chi^2=16.238$, $p<0.001$), any comorbidities and pregnancy associated illness ($\chi^2=11.008$, $p<0.001$), gestational age of the baby ($\chi^2=35.679$, $p<0.001$), weight of the baby ($\chi^2=22.931$, $p<0.001$), and preterm associated illness ($\chi^2=13.678$, $p=0.001$) at the 0.05 level of significance (Table 1). Further, all other sociodemographic variables were found to be independent of stress score among mothers with preterm babies admitted to NICU.

The results revealed with regard to coping strategies that it was found to be significantly associated with socio-demographic variables like age in years ($\chi^2=14.075$, $p=0.007$), educational status ($\chi^2=18.663$, $p<0.001$), occupation ($\chi^2=11.527$, $p=0.020$), monthly family income ($\chi^2=16.502$, $p=0.011$), place of residence ($\chi^2=52.867$, $p<0.001$), support system during hospitalization ($\chi^2=19.588$, $p<0.038$), mode of delivery ($\chi^2=35.814$, $p<0.001$), previous history of loss of child ($\chi^2=19.707$, $p<0.001$), any comorbidities and pregnancy associated illness ($\chi^2=18.158$, $p<0.001$), gestational age of the baby ($\chi^2=40.458$, $p<0.001$), weight

of the baby ($\chi^2=39.294$, $p<0.001$), duration of hospital stay ($\chi^2=30.915$, $p<0.001$), and preterm associated illness ($\chi^2=18.158$, $p=0.001$) at 0.05 level of significance (Table 1). Further, all other socio-demographic variables were found to be independent of coping strategies scores among mothers with preterm babies admitted to NICU.

Discussion

The present descriptive correlation study was conducted to assess stress and coping strategies among mothers with preterm babies admitted to NICU. This study was conducted among mothers with preterm babies, and the majority 36 (51.4%) of the participants were in the age group between 27-35 years. These age related findings were quite similar to another study conducted to study the stress and coping among these subjects where the majority of parents were between 28-32 years old.¹²

On considering the weight of the baby, most of the preterm babies 21(30%) belonged to weight of 1001-1500 gm in the current study and these weight related findings were quite similar to another study where the reported weight was 1600 gm and above.¹³

In terms of level of stress, the majority of the mothers with preterm babies 58 (82.8%) reported a high levels of stress whereas the least number of subjects 12 (17.2%) experienced low stress, with the overall mean percentage of stress reported as 64.51% in the present study. These stress related findings were quite similar to various other studies where the reports revealed that 40% and 28% of the parents experienced severe and moderate levels of stress respectively, and only the least number of them had mild stress with the mean percentage of stress ranging from 49.5% to 74.5% in various domains,¹² almost 96.6% of the mothers expressed moderate to severe and high level of stress,¹⁴ about 70% of the mothers reported moderate to severe level of stress,¹³ and one of the systematic reviews conducted had reported the high level of stress among the mothers of preterm babies and emphasised that maternal stress was higher than paternal stress with regard to preterm baby admission in NICU.⁷ Another study conducted to study the stress among mothers of preterm babies admitted to the NICU reported 86% of them experienced high and severe levels of stress which was very similar to the current study.¹⁵

The present study noted that, in terms of coping strategies used by the mothers with preterm babies, most of the mothers 36(51.4%) had demonstrated moderate level of coping. A study conducted in India also found that most of the mothers of preterm babies had reported average or moderate level of coping,⁸ and various other studies also reported the moderate level of coping among these subjects.^{3,11,13-14,16}

In the present study, Pearson correlation between stress and coping strategies revealed that there was a significant high negative correlation between stress and coping ($r=-0.713$, $p<0.001$) among mothers with preterm babies, which infers that an increase in the score of stress would result in decreased coping score and vice-versa with the strong inverse relationship. Similarly, the previous studies conducted in this population also reported negative and inverse relationship between stress and coping strategies.^{3,8-9} Whereas in contrast, one study had reported that there was no significant relationship was found between stress and coping strategies in this population.¹⁵

In the present study, both the stress and coping were found to be significantly associated with socio-demographic variables like age in years, educational status, support system during hospitalisation, mode of delivery, any comorbidities and pregnancy associated illness, gestational age of the baby, weight of the baby, and preterm associated illness. In addition, occupation, monthly family income, and place of residence were also associated with coping strategies. Similarly, one of the studies in this area had reported the association of monthly income, and place of residence with coping strategies.⁹ Another study reported association of stress with place of residence, occupation and weight of the baby.¹³ In contrast, few studies reported no association of socio-demographic variables with stress,^{11,14} but an association of religion and the number of children with coping strategies in these subjects.¹⁶

Conclusion

The present study concluded that stress and coping strategies among mothers of preterm babies admitted to NICU are measurable constructs and both were found to be negatively correlated among the mothers with preterm babies admitted to NICU. Most of the mothers had higher levels of stress, and the majority of them were using moderate levels of coping strategies to overcome the stressful situations. Further, the study showed the association of stress and coping strategies with various socio-demographic variables which infers the dependency of these phenomena with sample characteristics. To conclude, measuring parents' stress levels and pinpointing the biggest environmental stressor by analysing the aspects of a baby's parents and surroundings that can be stressful may help healthcare providers recognise the value of these relationships and provide better treatment. Though being its strength, the study provided adequate evidence by filling the gap in the literature to understand the relationship between stress and coping, it was limited to only selected hospitals. The study recommends the development and implementation of various psychological interventions among these subjects to minimise the stress and to improve coping abilities.

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