

NICU Admissions and Maternal Stress Levels

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Abstract

Objective To determine the stress levels among mothers of babies admitted in Neonatal Intensive Care Unit (NICU) and to identify demographic parameters that influence their stress levels.

Methods Stress levels were assessed using Parental Stressor Scale: Neonatal Intensive Care Unit (PSS: NICU) questionnaire among 100 NICU mothers by doctors between 6 and 8 d of admission. Maternal stress was quantified using Likert scale as low (1–2.9), medium (3–3.9) and high (4–5). The data was analyzed using SPSS Ver.16.

Results The mean scores for the subscales sights and sounds, looks and behaviour and alteration in the parental role were 2.55, 4.1 and 4.12 respectively. Increased maternal age, prematurity of baby, longer NICU stay and inability to directly breastfeed the baby were associated with higher stress levels.

Conclusions NICU mothers are under significant stress and appropriate counseling targeted towards specific stressors is required.

Keywords Maternal stress · Neonatal intensive care unit (NICU) · Stressor · PSS: NICU

Introduction

The hospitalization of a neonate in NICU is usually stressful for the mother and all the other family members. This

stressful nature of the NICU environment for parents especially mothers of sick babies is well documented in western literature [1–7]. NICU mothers experience multiple stressors related to preterm birth, medical condition of the baby, complexity of the NICU environment and perceived vulnerability of the infant, in addition to stressors associated with the normal transition process to parenthood [3, 6]. Identifying aspects of the babies, mothers and the environment that can cause stress may be useful in assisting health personnel in understanding their importance and in improving the quality of care. Understanding maternal stress may also help health personnel in assisting them towards improving their ability to meet the needs of their babies and to develop the skills required for fulfilling their role. This study was conducted to determine the levels of stress experienced by mothers of babies admitted in NICU using Parental Stress Scale: Neonatal Intensive Care Unit (PSS:NICU) and to identify infant and maternal characteristics which significantly influence their stress level.

Material and Methods

This descriptive study was carried out in the level III NICU of our tertiary care teaching hospital after approval from the Institute Ethical Committee. All mothers, whose babies were admitted in NICU from April through September, 2011 were serially recruited in the study. However, those mothers whose babies stayed in NICU for a shorter period (<24 h) were excluded. Informed consent was obtained from all the mothers interviewed. Demographic details of NICU mothers and hospitalization details of babies were collected.

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Maternal stress levels were assessed by Interns (first two authors of the study) using the Parental Stressor Scale: Neonatal Intensive Care Unit (PSS: NICU), a validated questionnaire to measure parental perceptions of the stressors encountered in the NICU [1]. The stress among mothers was measured between 6 and 8 d of admission of their babies in NICU. The questionnaire PSS: NICU focuses on three areas: visual stimuli and sounds, behavior & appearance and parental relationship with baby. The respondents answered a total of 29 items. Their responses were recorded in a Likert scale where 0 meant no experience with the described situation or phenomenon, 1 no stress response, 2 little stress, 3 moderate stress, 4 very stressful score and 5 indicated extreme stress in a given situation. Maternal stress levels were classified according to points on Likert scale as follows: low (1–2.9), medium (3–3.9) and high (4–5). Individual items of the questionnaires were first coded and processed using the statistical package for social sciences v.16. Demographic data and perceived stress of the mothers was evaluated statistically using descriptive statistics. The overall stress levels for each of the three subscales were used to compare with the socio-demographic and clinical characteristics of the mother and infants using ANOVA and Mann Whitney statistical tests and a statistical significance was set at p value < 0.05.

Results

A total of 100 postnatal mothers without previous psychiatric illness history were included in the present study. The mean age of the mothers participating in the study was 24.7 y with a range between 19 and 32 y. Eleven (11 %) of the mothers were not formally educated, 16 % went to primary school, 59 % received high school education while 14 % had a bachelor's degree. Sixty seven (67 %) of the mothers were home-makers while 33 % were employed. The major maternal obstetric complications recorded were premature rupture of membranes (31 %) and gestational hypertension (12 %). The birth weight of babies ranged from 950 to 2,800 g with a mean value of 1,780 g. Sixty five (65 %) were premature births (28–37 wk) and thirty five (35 %) were full term births. Seventy five (75 %) of the births were spontaneous vaginal while 25 % were caesarean or instrumental deliveries. Prematurity with hyaline membrane disease was the most common admission diagnosis (56 %) followed by birth asphyxia (11 %), cardiovascular problems (10 %), congenital anomalies (7 %), metabolic abnormalities (6 %), gastrointestinal problems (6 %) and jaundice (4 %). The various components of PSS: NICU and their

corresponding maternal stress scores are depicted in Table 1. The highest level of maternal stress was found in the areas of looks and behavior and alteration of parental role (Table 2).

Demographic characteristics like gravida, education and occupation did not significantly affect the stress levels of NICU mothers. However, increasing age of mother and longer period of NICU stay were associated with higher levels of stress. Mothers who directly breastfed their babies had significantly lower stress as compared to mothers who did not. The stress level of mothers of preterm babies was found to be significantly higher than mothers of term infants in all the three domains (Table 3).

Discussion

Maternal stress in NICU setting is often a neglected area. There are no Indian studies quantifying stress among NICU mothers. This is perhaps the first Indian study pertaining to this important issue. It is very crucial for NICU staff and doctors to identify specific stressors among NICU mothers so that they develop appropriate intervention protocols that can better address the mothers' fear, reduce their stress and enhance their ability to understand and cope up with the complex NICU environment. Using the PSS: NICU, Miles et al identified the most stressful aspect of the NICU for 122 parents to be an alteration in the parent–infant relationship and the infants' appearance. The sights and sounds of the NICU caused lesser stress, and few parents reported stress in the area of staff communication and relationships [2]. The findings in the present study are similar to that by Miles et al. The mean subscale stress score was the highest for parental role alteration (4.12) followed by looks and behavior of the baby (4.10) and sights and sounds (2.55). Seventy percent of mothers perceived higher level of stress in the two domains namely parental role alteration and looks and behavior of the baby (Table 2). Probably health personnel should give more emphasis to the components in these two subscales while counseling for stressors among NICU mothers. In our NICU setting, very sick newborns including the babies being ventilated are kept inside a cubicle with glass walls and mothers can only view from a distance and the glass partition prevents sounds including alarms and monitor beeps being transmitted. This probably could be the reason why sights and sounds in the present study seem to be poorly correlated with total score and other domains. Among the individual components, 'not feeding my baby myself' and 'feeling helpless about how to help my baby during this time' were the stressors with maximum scores. This reemphasizes the fact that once a mother directly feeds her baby, she is likely to be stress free.

Table 1 Maternal stress as measured by PSS: NICU ($n=100$)

Subscales and components	Stress score	
	Mean	S.D.
Sights and sounds		
Presence of monitors and equipment	2.30	0.822
Constant noises of monitors and equipments	2.29	0.848
Sudden noises of monitor alarms	2.63	0.860
Other sick babies in the room	3.40	0.660
large number of nurses and doctors in NICU	1.52	0.835
Having a ventilator to breathe for baby	4.34	0.480
Mean score	2.55	0.631
Looks and behavior		
Presence of tubes and equipments on or near my baby	3.92	0.807
Seeing needles and tubes being put on my baby	4.27	0.583
Unusual color of my baby (yellow/pale)	4.20	0.836
Small size of my baby	3.98	0.634
Wrinkled appearance of my baby	4.02	0.668
Baby fed by tube or intravenous line	4.30	0.587
The limp or weak appearance of my baby	4.10	0.732
Baby not crying like other babies	4.13	0.693
Jerky movements of my baby	4.00	0.547
Seeing my baby in pain	3.82	0.808
Seeing my baby looking sick	4.30	0.867
Mean score	4.10	0.583
Parental role alteration		
Being separated from my baby	4.14	0.681
Not feeding my baby myself	4.57	0.545
Not being able to care for my baby myself	4.30	0.676
Not being able to hold my baby when I want	4.39	0.626
Feeling helpless and unable to protect my baby from painful procedures	4.25	0.683
Feeling helpless about how to help my baby during this time	4.57	0.742
Not having time to be alone with my baby	4.21	0.774
Sometimes forgetting what my baby looks like	4.37	0.744
Not being able to share my baby with other family members	3.89	0.814
Feeling that staff is closer to my baby than I am	3.15	1.075
Mean score	4.12	0.626

It is rather surprising that the maternal characteristics like gravida, education and occupation did not significantly affect the stress levels of NICU mothers. This emphasizes the fact that irrespective of the educational background and previous delivery experience, NICU mothers are always under stress and they require special attention and specific

NICU educational support. According to a study by Dudek-Shriber, consistent predictors of stress were length of stay, extreme prematurity, and a cardiovascular diagnosis [8]. In the present study, increased maternal age, prematurity of baby and longer NICU stay were significantly associated with higher maternal stress. Although, these parameters are

Table 2 Number of mothers at different stress levels ($n=100$)

Subscales	High level (4.0–5.0)	Medium level (3.0–3.9)	Low Level (1.0–2.9)
Sights and sounds	02	27	71
Looks and behavior	70	28	02
Parental Role	70	25	05

Table 3 Maternal stress level in relation to demographic parameters

Characteristic	Groups	n	Mean subscale stress scores(S.D)			p value
			Sights & sounds	Looks & behavior	Parental role	
Age	19–25	66	2.58(0.67)	4.01(0.58)	4.03(0.60)	<0.05
	26–32	34	2.49(0.55)	4.28(0.54)	4.29(0.63)	
Education	Uneducated	11	2.38(0.64)	4.34(0.63)	4.18(0.54)	>0.05
	Primary	16	2.57(0.88)	4.35(0.57)	4.23(0.58)	
	High School	59	2.51(0.57)	3.98(0.56)	4.09(0.64)	
Occupation	Graduate	14	2.85(0.43)	4.07(0.69)	4.07(0.69)	>0.05
	Homemaker	67	2.51(0.66)	4.12(0.56)	4.17(0.60)	
Gravida	Employed	33	2.63(0.56)	4.07(0.63)	4.01(0.66)	>0.05
	Primi	46	2.61(0.74)	4.13(0.49)	4.16(0.51)	
Expectancy(y)	Multi	54	2.50(0.51)	4.08(0.65)	4.08(0.71)	>0.05
	0–2	66	2.55(0.67)	4.08(0.57)	4.09 (0.60)	
Type of delivery	>2	34	2.56(0.53)	4.14(0.59)	4.17(0.67)	>0.05
	Vaginal	75	2.53(0.60)	4.08(0.57)	4.08(0.64)	
Length of stay (d)	Caesarian	25	2.61(0.70)	4.16(0.59)	4.22(0.58)	>0.05
	Short (<7)	26	2.69(0.60)	3.45(0.46)	3.46(0.65)	
Maturity of baby	Long (>7)	74	2.14(0.53)	4.33(0.42)	4.35(0.41)	<0.05
	Preterm	65	2.64(0.62)	4.18(0.56)	4.26(0.61)	
Mode of feeding	Term	35	2.39(0.62)	3.96(0.59)	3.86(0.59)	<0.05
	Direct	24	2.10(0.57)	3.42(0.41)	3.39(0.61)	
	Expressed	76	2.69(0.58)	4.32(0.44)	4.35(0.42)	

usually unavoidable and sometimes not modifiable, the present study highlights them as high risk groups who are likely to be pressurized by increased stress and thus warrant necessary attention and counseling. A study by Carvalho et al confirmed the need for psychological support for mothers of preterm infants and the use of materials focusing on prematurity for reduction of the situational anxiety on a clinical level [9].

Though this stress measurement tool has not been tested in Indian mothers, the psychometric properties of the PSS: NICU, including internal consistency reliability and construct, concurrent and predictive validity have been evaluated and found to be consistently significant [10, 11]. However, the present study also has a few limitations. It measures only mothers' stress and fathers' experience is not measured or compared. Variation in time of administration of the PSS: NICU (6–8 d of admission in NICU) is another limitation because different events happen at particular times in the unit.

More often, NICUs especially in the public sector in India are so busy that health personnel including doctors and nurses find less time to focus on maternal stressors in the NICU environment and give appropriate counseling to alleviate their anxiety. There are no separate counselors designated for the same. Even in NICUs where doctors do the counseling, the condition of babies is regularly appraised while these finer aspects of maternal stressors are often

neglected. According to a study by Jopek et al, the factors causing severe parental stress were identified to be respiratory distress of the newborn, necessity of mechanical ventilatory support and vital signs monitor alarm activation. It was also possible to decrease the stress level among NICU parents by explaining the background of the disease, the current clinical condition of the newborn, the necessity of diagnostic and treatment procedures and involving the parents in the basic care of the newborn [12]. The present study also highlights the need for appropriate counseling/ NICU education support to reduce stress among NICU mothers with respect to all the three subscales of PSS: NICU.

Conflict of Interest None.

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References

1. Miles MS, Funk SG, Carlson J. Parental stressor scale: neonatal intensive care unit. *Nurs Res*. 1993;42:148–52.
2. Miles MS, Funk SG, Kasper MA. The neonatal intensive care unit environment: sources of stress for parents. *AACN Clin Issues Crit Care Nurs*. 1991;2:346–54.
3. Miles MS, Funk SG, Kasper MA. The stress response of mothers and fathers preterm infants. *Res Nurs Health*. 1992;15:261–9.

4. Singer LT, Salvator A, Guo S, et al. Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. *JAMA*. 1999;281:799.
5. Shields PD, Pinelli J. Variables associated with parental stress in neonatal intensive care units. *Neonatal Netw*. 1997;16:29–37.
6. Holditch-Davis D, Miles MS. Mothers' stories about their experiences in the neonatal intensive care unit. *Neonatal Netw*. 2000;19:13–21.
7. Pehudoff B. Parents' perceptions of environmental stressors in the special care nursery. *Neonatal Netw*. 1990;9:39–44.
8. Dudek-Shriber L. Parent stress in the neonatal intensive care unit and the influence of parent and infant characteristics. *Am J Occup Ther*. 2004;58:509–20.
9. Carvalho AE, Linhares MB, Padovani FH, Martinez FE. Anxiety and depression in mothers of preterm infants and psychological intervention during hospitalization in neonatal ICU. *Span J Psychol*. 2009;12:161–70.
10. Steedman WK. Stress experienced by parents from the neonatal intensive care unit. 2007 http://library.canterbury.ac.nz/bitstream/10092/2781/1/thesis_fulltext.pdf Assessed on 17th April 2012.
11. Franck LS, Cox S, Allen A, Winter I. Measuring neonatal intensive care unit-related parental stress. *J Adv Nurs*. 2005;49:608–15.
12. Jopek A, Gadzinowska-Szczucinska J, Szczapa T. Evaluation of stress responses in parents of newborns hospitalized in the Intensive Care Unit. *Ginekol Pol*. 2009;80:367–73.