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A study to assess the level of stress among mothers of neonates admitted in neonatal intensive care unit (NICU) at selected hospital, Kolkata, West Bengal

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Abstract
Findings revealed that 79.6%,11%, 9.4% mothers had moderate stress, low stress and high stress level respectively in Neonatal Intensive Care Unit. In the domain of "Sights and sounds" 90.6% and 9.4% mothers had moderate stress and high stress respectively. In the "Baby's look, behave and treatment in NICU",85.7%, 9.4% and 4.9% mothers had moderate, high and low stress level respectively. In the "Relationship with baby and parenting role", 75.9%,13.5%,10.6% had moderate, high, low stress level respectively. In the "Staff behaviour and communication", 82.4%,13.5%,4.1% had moderate, high and low stress level. In overall stress experience 98.8%, 1.2% had moderate and high stress level respectively. The study showed that there was significance association between level of stress of mothers and occupation of mothers of neonates [χ^2 (df 6) = 12.59] at 0.05 level of significance. There was significance association between level of stress of mothers and age of neonates [χ^2 (df 4) =9.49] at 0.05 level of significance and level of stress is associated with diagnosis of neonates [χ^2 (df 8) = 15.51] at 0.05 level of significance and level of stress is associated with gestational age of neonates at the time of delivery [χ^2 (df 2) = 5.99]at 0.05 level of significance.

Keywords: Level of stress

Introduction

In 2015 by K Prasanna Vinod conducted a study to assess parental stress among mothers of neonates admitted in NICU descriptive cross-sectional design was adopted to assess the parental stress among mothers of neonates admitted in NICU in selected hospital. Majority of mothers were suffered mild stress. There is a significance association between the level of parental stress among mothers of neonates and selected demographic variables such as educational qualification, occupation and dietary pattern [2].

In 2016 by Linda Dudek Shriber conducted a study to assess stress level of parents in NICU and the influence of parent and infant characteristics by using PSS: NICU, 46 items self-reported instrument to explore level of stress. Parents ethnicity and their education have high frequency of stress, the strongest predictor was also the infant's length and stay. For stress occurrence the parents age has the strongest impact, with the youngest group of parents experiencing the greatest stress occurrence regarding their relationship and role. The most important predictor of overall stress was having an infant with a diagnosis of prematurity with respiratory distress. The second most important predictor was a longer length of stay [1].

In 2018 by Kogila.P and Vijaya Kumar P conducted a study parental stress of newborn admitted in Neonatal Intensive Care Unit revealed that majority of parents has moderate stress level, The association between demographic variables in relation with the level of stress of the parents of newborn [4].

In 2019 by Lavanya Subhashini, Radha MS conducted a study to assess the stress among parents of Neonates admitted in Neonatal Intensive Care Unit of tertiary care teaching hospital. The level of stress was more in the area of parenting role alteration and child appearance and behavior compared to sights and sounds, illness related factors, financial factors, social factors, and religious factors. The findings also revealed that the stress was more among parents having male child [5].

In 2019 by Akhilesh Sharma conducted a study to assess the level of stress adopted by parents of the neonates admitted in NICU in selected hospital, Bangalore, majority of mothers were suffered from moderate level of stress. Demographic variables have no influence on the level of stress of mothers of neonates admitted in NICU. But the age, type of family and weeks of gestation steam may be a significant factor in determining the level of stress of parents of the neonates admired in NICU [3].

In 2020 by Mamani Das and Krishna Das conducted a study to assess the level of stress and coping mechanism among mothers of Neonates admitted in Neonatal Intensive Care Unit in selected hospitals in Assam. A structured interview schedule was developed to collect the demographic information, stress and coping mechanism among mothers. The findings revealed that majority of mothers has moderate stress level. There was no significant association observed between stress and demographic variables [6].

In 2021 a study was conducted by Amar Mulla, Shri Vinoba Bhave College of Nursing to assess stress among mothers of neonates admitted in NICU, 50 samples were collected in this study, majority of mothers had severe stress level whose neonates admitted in NICU [15].

The neonatal intensive care unit has long been recognized as an emotionally charged and highly stressful place. The problem of premature and congenitally ill infants is not a new one [4]. As early as the 17th and 18th centuries there were scholarly papers published that Admission of a child to the Neonatal intensive care unit may be one of the most stressful events for parents. The process of hospitalization is a very traumatic experience for children as well as parents [6]. Friedman (1977) describes hospitalization us a highly stressful situation. The parents are anxious and preoccupied with many concerns arising from their knowledge and perception about hospital and perception about hospital and hospital personnel. Before the industrial revolution premature and ill infants were born and cared for at home and either lived or died without medical intervention [11].

Objectives:

1. To assess the level of stress experienced by mothers at NICU at selected hospital.
2. To find out the association between level of stress and socio demographic variables.
3. To find put the association between level of stress and clinical profile of neonate.

Review of literature

Literature related to stress level of mothers of neonates who are admitted in Neonatal Intensive Care Unit (NICU)

Linda Dubek Shriber conducted a descriptive study of parent stress in the Neonatal Intensive Care Unit and the influence of parent and infant characteristics. The aim of the study investigated the stress experienced by parents in the Neonatal Intensive Care Unit (NICU), the infant and parent characteristics that resulted in different stress responses, and the characteristics that were predictive of stress. Convenience sampling technique used in the study.162 parents of infants in a large urban hospital was recruited for the current study. To obtain data on stress the researcher approached the parents at a time when they were visiting but not holding their baby, and when not involved with other NICU personnel. PSS: NICU scale was developed by Miles contains 46 items self-report instrument that was used in this study to measure the parent's perceptions of stress within the NICU. The scale consists of four subscales that measure stress related to sights and sounds of the unit (5 items), the appearance and behaviours of the infant (19 items), the impact on the parent's role and their relationship with the baby (10 items) and the parents relationship and communication with the staff (11 items). There is also an overall feeing of stress related to having an infant in the NICU. It is a 5-point Likert scale, 1 (not at all stressful) to 5 (extremely stressful). The highest levels of stress experience were in the relationship with baby parental role area and regarding how the baby looked and behaved. The infant characteristics of gestational age resulted in significantly different scores concerning the baby's appearance and behaviour. Consistent predictors of stress were length of stay, extreme prematurity and a cardiovascular diagnosis. A feeling of general stress was highest for parents. The subscale in which they reported their greatest stress was in the relationship with baby/parental role area. Parents experienced a little to a moderate degree of stress regarding how their baby looks and behaves. The sights and sounds of the unit caused only a little stress and the area of staff behaviours and communication was not particularly stressful at all. When examining the mean scores for the entire scale the stress occurrence score that indicates whether something was stressful or not was in the a little stressful range (M=2.71, SD=.73). The overall stress score that indicates the degree of stress parents experienced was also within this same range (m=2.36, SD=.66). The infant characteristics of gestational age was significant in relation to the stress occurrence score on the baby looks and behaves subscale (F=6.263, p=.002). Parents of infants less than 28 weeks gestational age obtained significantly higher stress occurrence score (M= 3.70, Sd = 1.75)). Than parents whose parents whose infants who were in 28-36-week range (M=2.91, SD=.96). It should be noted that for the overall stress score on this subscale the F value was not significant (F=4.480, p=0.013) at 0.01 [1].

K Prasanna Vinod conducted a study at Neonatal Intensive Care Unit in selected hospital, Nellore. The aim of the study to assess the parental stress among mothers of neonates admitted in NICU. Descriptive cross-sectional design was adopted to assess the parental stress among mothers of neonates admitted in NICU in selected hospital in Nellore. A sample size of 30 mothers of neonates in NICU were selected through non-probability convenience sampling technique. The data was collected by using parental stressor scale. Score was interpreted by mild stress (>20), moderate stress (21-40), severe stress (41-60). With regard to level of parental stress among mothers of neonates admitted in NICU, majority of mothers (60%) had mild stress, 40% had moderate stress. There is significant association between the level of parental stress among mothers of neonates admitted in NICU with their selected demographic variables such as educational qualification, occupation and dietary pattern [2].

Assumptions:

1. Mothers of the neonates who are admitted in Neonatal Intensive Care Unit are stressed in a selected hospital.
2. Mothers are cooperative during the study.

Variables

Research variables: Level of stress of mothers of neonates in terms of sights and sounds, baby looks, behaves and treatments, relationship with baby and parenting role, staff behaviors and communication.

Socio Demographic variables: Age of mother, religion, occupation, education, family income, family type, residence, no. of child.

Clinical profile of neonate: Age of neonate, gender of neonate, birth weight, mode of birth, Apgar score, diagnosis of neonate, gestational age of the mother at the time of delivery, birth order of the neonate, duration of hospital stay on the day of data collection, neonate is on ventilator/Bipap/Cpap/Cardiac monitor/any congenital anomalies.

Materials & Methods

Research Approach: Quantitative research

Research Design: Descriptive survey

Setting: R.G. Kar medical college and hospital has a well-equipped Neonatal Intensive Care Unit (NICU)

Population: The population was mothers of neonates admitted in Neonatal Intensive Care Unit (NICU).

Sample: Mothers of the neonates admitted in Neonatal Intensive Care Unit (NICU) of R.G. Kar medical College and Hospital were chosen as the sample.

Sample size: 245 mothers of neonatal admitted in Neonatal Intensive Care Unit of R.G. Kar Medical College and Hospital, Kolkata. (For limited time period)

Sample Selection Criteria:

Inclusion criteria

1. Mothers of neonates who were available during data collection period.

2. Mothers of neonates who admitted in hospital not shorter than 24 hours.
3. Mothers who were willing to participate in this study
4. Mothers who were able to understand, read and write English/Bengali language.

Exclusion criteria

1. Mothers who were have complications related to delivery
2. Mothers who will have post-partum mental disorders.

Table 1: Data collection tools and technique Variables Tools Techniques

Variables	Tools	Techniques
Socio demographic variables of mother	Tool 1 (A) Socio demographic Proforma of mother	Self reporting by paper pencil method
Clinical information of neonate	Tool 1(B) clinical profile proforma of neonate	Record analysis
Level of stress	Tool II Modified PSS:NICU scale	Self reporting by Paper Pencil method

Reliability of the tool: (Tool II Modified PSS: NICU)

The measurement of reliability was done by split half method to find out the internal consistency of the tool and was calculated by divide items in two equal parts through grouping in odd number questions and even number questions, then administered two subparts of tool simultaneously, score them independently, and compute the correlation coefficient on the two separate scores. By using the method reliability of the tool was 0.80, indicating the tool was reliable.

Organization of data and analysis of data:
Section-1: Description of sample characteristics

Section-II: Description of the level of stress in terms of domains such as sights and sounds, Baby looks, behaves and treatment, Relationship with baby and parenting role, Staff behaviour and communication and overall stress experience

Section-III: Association between level of stress with selected demographic variables such as age of mother, religion, occupation, education, family income, type of family, place of residence and number of children.

Section-IV: Association between level of stress with clinical condition such as age of neonates, gender, birth weight, mode of delivery, Apgar score, diagnosis of neonate, gestational age of the mother at the time of the delivery, Birth order of the neonate, duration of hospital stay on the day of data collection, neonate in on ventilator/Bipap/Cpap/Cardiac monitor/any congenital anomalies.

Section I: Description of sample characteristics
The data were collected from 245 mothers of neonates admitted in Neonatal Intensive Care Unit of R.G. Kar Medical College and Hospital, Kolkata. The following background information were collected by self-reporting questionnaire, age of mothers, religion, occupation, education, family income, family type, residence, No. of child. Record analysis of age of neonate, gender, birth weight, mode of birth, Apgar score, diagnosis of neonate, gestational age of the mother at the time of delivery, birth order of the neonate, duration of hospital stay on the day of data collection, neonate is on ventilator/Bipap/Cpap/cardiac monitor/any congenital anomalies.
The sample characteristics were presented in Table 2 and Table 3 in the form of frequency and percentage

Statistical Analysis:

Table 2: Frequency and percentage distribution of back ground information of mother of neonates, clinical information of neonates admitted in Neonatal Intensive Care Unit

N= 245

Variables	Frequency	Percentage (%)
Age of mother (in years)		
18-22	119	48.6
23-27	89	36.3
28-32	37	15.1
Religion of mother		
Hindu	26	86.7
Muslim	4	13.3
Christian	18	7.3
Others	5	2.0
Occupation of mother		
House wife	156	63.7
Professional	24	9.8
Non-professional	43	17.6
Others	22	9.0
Education of mother		
No formal education	75	30.6
Primary	79	32.2
Secondary	64	26.1
Higher secondary	18	7.3
Graduates and above	9	3.7

N=245

Variables	Frequency	Percentage (%)
Income of family		

<Rs. 10,000	43	17.6
Rs 10,000 - Rs 20,000	87	35.5
>Rs. 20,000	115	46.9
Type of Family		
Joint	114	46.5
Nuclear	131	53.5
Place of Residence		
Urban	140	57.1
Rural	105	42.9
No. of children		
One child	140	57.1
Two children	75	30.6
Three children and more	30	12.2
Age of neonate		
1-10 days	102	41.6
11-20 days	97	39.6
21-28 days	46	18.8
Gender of neonate		
Male	130	53.1
Female	115	46.9
Birth weight of neonate		
Above 2.5 kg	97	39.6
1.5-2.5 kg	68	27.8
<1.5 kg	80	32.7
Mode of birth		
Normal	129	52.7
Caesarean	116	47.3
Apgar score		
0-3	22	9.0
4-6	43	17.6
7-10	180	73.5
Diagnosis of neonate		
Respiratory distress	58	23.7
Prematurity	71	29.0
Gastrointestinal disease	40	16.3
Congenital disease	40	16.3
Others	36	14.7

Variables	Frequency	Percentage (%)
Gestational age of neonate at birth time		
28-36 weeks	68	27.8
37-42 weeks	177	72.2
Birth order of neonate		
1st child	140	57.1
2nd child	75	30.6
3rd child or more	30	12.2
Duration of hospital stay on the day of data collection		
1-3 days	121	49.7
4-6 days	81	33.1
7-9 days	34	13.9
10-12 days	9	3.7
Neonate is on ventilator/BiPAP/CPAP/cardiac monitor/any congenital anomalies		
Yes	36	14.7
No	209	85.3

Data presented revealed that Data presented in Table 2 revealed that the majority (48.6%) of mothers were belong to age group of 18-22. Maximum mothers (86.7%) were Hindu and maximum mothers (63.7%) were house wife. 32.2% mothers were primarily educated, 46.9% of family income was > Rs 20,000. Majority (53.5%) of family were nuclear. 57.1% people were placed in urban area. 57.1% mothers had one child majority (41.6%) neonates were 1-10 days, 53.1% neonates were male. 39.6% of neonates were birth weight above 2.5 kg. Majority (52.7%) neonates born by normal delivery. 73.5% of neonates were Apgar score 7-10. 29% of neonates were premature. Majority (72.2%) baby were born at gestational age of 28-36 weeks at birth time. 57.1% of neonates were 1st child. Majority (49.7%) neonates stayed at hospital for 1-3 days on the day on data collection. 85.3% of neonates have on ventilator/Bipap/Cpap/Cardiac monitor/Congenital anomalies

Section-II: Description of level of stress of mothers of neonates admitted in Neonatal Intensive Care Unit in terms of four domain such as sights and sounds, baby looks, behaves and treatments, relationship with baby and parenting role, staff communication and behaviour, overall stress experience.

The data on mother's stress level were collected by using modified PSS: NICU tool contains 32 items. Corresponding

to four subscales and a general stress item. The four subscales and their numbers of items are as follows: Sights and sounds, 5 items. Infant appearance, 7 items, Parent infant relationship, 9items and staff behaviour and communication,10 items and a general stress scale. Participants have to rate of each item according to how stressful the situation described in each item was for them:
1= not at all stressful,2= a little stressful,3= moderately stressful, 4= very stressful, 5= extremely stressful.
This score method only employs items that have been rated from 1-5 by a mother, so items rated "not applicable" are treated as missing. The possible range of total scores are- "Sights and sounds" domain minimum possible score 1, maximum score 25, "Baby looks, behaves and treatment" domain minimum score 1, maximum score 35, "Relationship with the baby and parenting role" domain minimum score 1, maximum score 45, "Staff behaviour and communication" domain minimum score 1, maximum score 50, "overall experience" minimum score 1, maximum score 5
Hence, the total number of items were 32 and minimum score was 1, maximum score was 160
Mean score and SD of level of stress and of each domain were calculated and stress levels were classified into, "mild stress level", "moderate stress level", "Severe stress level" on the basis of Mean $\pm$ SD.
So, the level of stress of mothers was "Severe stress level", "Moderate stress level", "Mild stress level" when the obtained total score was >56,34-56 and <34 respectively.
In the domains of "Sights and Sounds" level of stress was classified "Severe stress level", "Moderate stress level", "Mild stress level" when the obtained total score was >12,4-12 and <4 respectively.
In the domains of "Baby looks, behaves and treatment" level of stress was classified "Severe stress level", "Moderate stress level", "Mild stress level" when the obtained total score was >12,6-12 and <6 respectively.
In the domains of "Relationship with baby and parenting role" level of stress was classified "Severe stress level", "Moderate stress level", "Mild stress level" when the obtained total score was >19,13-19 and <13 respectively.
In the domains of "Staff behaviour and communication" level of stress was classified "Severe stress level", "Moderate stress level", "Mild stress level" when the obtained total score was >11,5-11 and <5 respectively.
In the domains of "Overall stress experience" level of stress was classified "Severe stress level", "Moderate stress level", "Mild stress level" when the obtained total score was >4,2-4 and <2 respectively.
The stress level of mother in terms of three domains were described with the help of Figure 1, Figure 2 and Table 4, Table 5

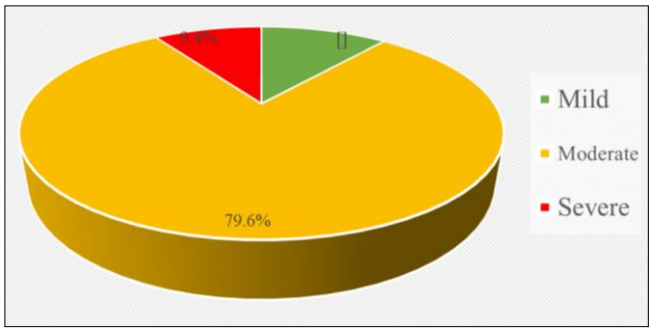

Fig 1: Pie diagram showing percentage distribution of stress level of mothers of neonates admitted in Neonatal Intensive Care Unit

Figure 1 depicted that majority of mothers of neonates who were admitted in Neonatal Intensive Care Unit have moderate stress level (79.6%)

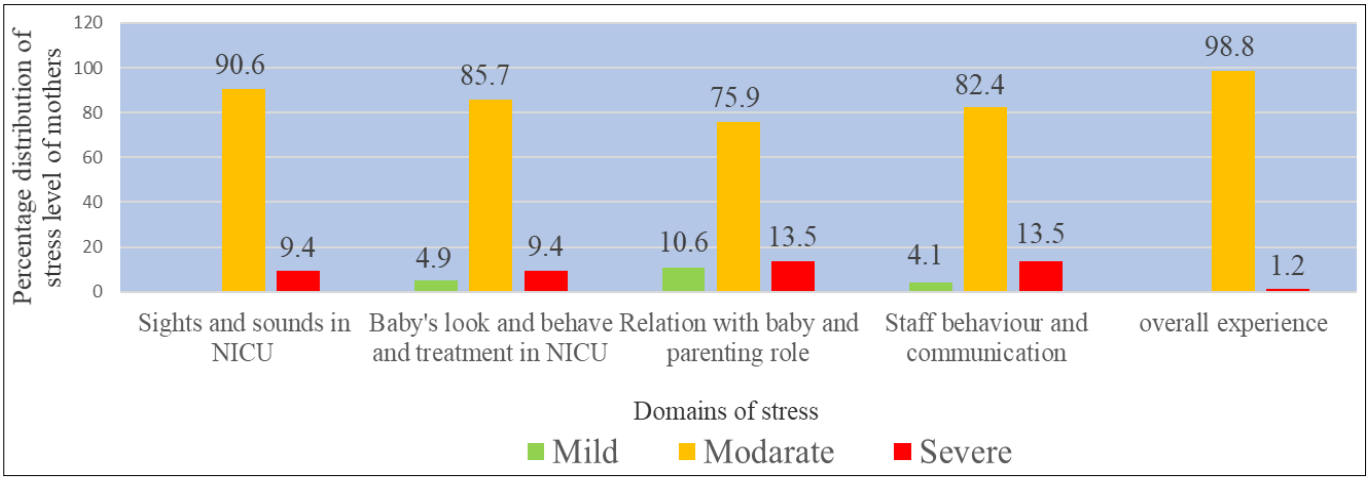

Fig 2: Bar diagram shows level of stress in each domain of mothers of neonates admitted in NICU

Data presented in figure 2 describes that in the domain, sights and sounds in NICU 90.6% of mothers were moderately stressed, 9.4% of mothers have severe stress. In baby's looks and behaves 85.7% of mothers have moderate stress level. In relationship with baby and parenting role 75.9% of parents have moderate stress. In staff behaviour and communication 82.4% of mothers have moderate stress and in overall experience 98.8% of mothers have moderate stress level.

Table 3: Range, mean, mean percentage and standard deviation of level of stress, Domains of stress of mothers of neonates N=245

Variable	Range	Mean	Mean Percentage	Standard Deviation
Level of stress	22 (34-56)	44.84	80.07	10.54

Domains of stress				
Sights and Sounds	8 (4-12)	8.13	67.75	3.87
Baby's looks, behaves and treatment	6 (6-12)	8.69	72.41	2.9
Relationship with baby and Parenting role	6 (13-19)	16.46	86.63	3.13
Staff behavior and Communication	7 (5-11)	8.38	63.63	3.4
Overall Experience	2 (2-4)	3	75	1

Table 3 depicted that mean percentage is highest (86.63) in relationship with baby and parenting role, and lowest (63.63) in staff behavior and communication.

Section-III: Association between level of stress with selected demographic variables such as age of mother, religion, occupation, education, family income, type of family, place of residence and number of children.
Stress level of mother can be influence by certain demographic characteristics. In this section the association between stress level of mothers and age of mother, religion, occupation, education, family income, type of family, place of residence and number of children.

Section-IV: Association between level of stress with clinical condition such as age of neonates, gender, birth weight, mode of delivery, Apgar score, diagnosis of neonate, gestational age of the mother at the time of the delivery, Birth order of the neonate, duration of hospital stay on the day of data collection, neonate in on ventilator/Bipap/Cpap/Cardiac monitor/any congenital anomalies
Stress level of mother can be influence by clinical condition such as age of neonates, gender, birth weight, mode of birth, Apgar score, diagnosis of neonate, gestational age of the mother at the time of the delivery, Birth order of the neonate, duration of hospital stay on the day of data collection, neonate in on ventilator/Bipap/Cpap/Cardiac monitor/any congenital anomalies

Table 4: Association between level of stress and socio demographic variables of mothers of neonates and level of stress and selected clinical profile of neonates admitted in Neonatal Intensive Care Unit admitted in Neonatal Intensive Care Unit
N=245

Variables	Mild	Moderate	Severe	Total	Calculated Chi-square (χ^2 test)	df	P value
Age							
18-22	13	92	14	119			
23-27	9	73	7	89	1.84	4	0.77
28-32	5	30	2	37			
Religion of Mother							
Hindu	19	130	12	161			
Muslim	8	45	8	61	8.62	6	0.19
Christian	0	17	1	18			
Others	0	3	2	5			
Occupation of Mother							
House wife	22	123	11	156			
Professional	3	21	0	24	15.2*	6	0.01
Non-professional	2	35	6	43			
Others	0	16	6	22			
Education of Mother							
No formal education	8	62	5	75			
Primary	8	61	10	79			
Secondary	9	49	6	64	3.28	8	0.921
Higher secondary	1	15	2	18			
Graduates and above	1	8	0	9			
Income of Family							
<Rs. 10,000	5	34	4	43			
Rs 10,000 - Rs 20,000	7	72	8	87	1.41	4	0.85
>Rs. 20,000	15	89	11	115			
Type of Family							
Joint	12	92	10	114	0.166	2	0.92
Nuclear	15	103	13	131			
Place of Residence							
Urban	13	110	17	140	3.57	2	0.16
Rural	14	85	6	105			
No. of Children							
One child	17	112	11	140			
Two children	7	61	7	75	2.63	4	0.62
Three children and more	3	22	5	30			

N = 245

Variables	Mild	Moderate	Severe	Total	Calculated Chi-square (χ^2 test)	df	P value
Age of Neonate							
1-10 days	17	81	4	102	13.57*	4	0.007
11-20 days	5	81	11	97			

21-28 days	5	33	8	46			
Gender of Neonate							
Male	10	106	14	130	3.47	2	0.176
Female	17	89	9	115			
Birth Weight of Neonate							
Above 2.5 kg	17	72	8	97			
1.5-2.5 kg	6	55	7	68	7.53	4	0.110
<1.5 kg	4	68	8	80			
Neonate Born By							
Normal	18	101	10	129	2.961	2	0.23
Caesarean	9	94	13	116			
Apgar Score							
0-3	3	17	2	22			
4-6	1	35	7	43	6.298	4	0.127
7-10	23	143	14	180			
Diagnosis of Neonate							
Respiratory distress	5	46	7	58			
Prematurity	4	60	7	71			
Gastrointestinal disease	13	25	2	40	19.21*	8	0.009
Congenital disease	4	33	3	40			
Others	1	31	4	36			
Gestational Age of Neonate at Birth							
28-36 weeks	2	60	6	68	6.49*	2	0.03
37-42 weeks	25	135	17	177			
Birth Order of Neonate							
1st child	17	112	11	140	2.634	4	0.62
2nd child	7	61	7	75			
3rd child or more	3	22	5	30			

N=245

Variables	Mild	Moderate	Severe	Total	Calculated Chi-square (χ^2 test)	df	P value
Duration of Hospital Stay on the Day of Data Collection							
1-3 days	16	92	13	121			
4-6 days	8	66	7	81	2.168	6	0.91
7-9 days	3	28	3	34			
10-12 days	0	9	0	9			
Neonate is on Ventilator/BiPAP/CPAP/Cardiac Monitor/Any Congenital Anomalies							
Yes	1	29	6	36	4.94	2	0.08
No	26	166	17	209			

$\chi 2$ (df 2) = 5.99, $\chi 2$ (df 4) = 9.49, $\chi 2$ (df 6) = 12.59, $\chi 2$ (df 8) = 15.51, $p < 0.05$, * significant

Data represented that there was significance association between level of stress of mothers and age of neonates $\chi 2$ (df 4) =13.57 at 0.05 level of significance and level of stress is associated with diagnosis of neonates $\chi 2$ (df 8) = 19.21 at 0.05 level of significance and level of stress is associated with gestational age of mothers at the time of delivery $\chi 2$ (df 2) = 6.49 at 0.05 level of significance.

Result

Findings related to the background information characteristics of the mothers of neonates admitted in Neonatal Intensive Care Unit:

- Majority (48.6%) of mothers were aged between 18-22 years.
- Most of mothers (86.7%) of mothers were Hindu.
- Majority (63.7%) of the mothers were housewife.
- In educational qualification most of mothers (32.2%) were primarily educated.
- 46.9% of mothers were from income of family was >Rs 20,000.
- Most of mothers (53.5%) had nuclear family.
- 57.1% of mothers had one child.

2. Findings related to the background information characteristics of the mothers of neonates admitted in Neonatal Intensive Care Unit:

- Most of neonates (41.6%) admitted in Neonatal Intensive Care Unit were age of 1-10 days age group
- Among the admitted neonates (53.1%) neonates were male.
- Most of neonates (39.6%) were birth weight above 2.5 kg.
- Major (52.7%) of neonates born by normal delivery.
- Major (73.5%) of neonates have Apgar score 7-10.
- Among the admitted neonates (29%) neonates were diagnosed as pre-mature neonates.
- 72.2% of neonates were born on gestational age of mother at birth time was 28-36 weeks.
- Majority (57.1%) neonates were 1st child.
- 49.7% of neonates stayed at hospital for 1-3 days on the day of data collection.
- Major (85.3%) of neonates is on ventilator/Bipap/Cpap/cardiac monitor/any congenital anomalies.

2. Findings related to the level of stress of mothers of neonates admitted in Neonatal Intensive Care Unit:

- Most of mothers (79.6%) had moderate stress level of neonates admitted in Neonatal Intensive Care Unit.
- Majority of mothers had moderate stress level in the domain of Sights and sounds.
- Majority of mothers had moderate stress level in the domain of baby looks, behaves and treatment in NICU.
- Majority of mothers had moderate stress level in the domain of relationship with the baby and parenting role.
- Majority of mothers had moderate stress level in the domain of staff communication and behavior.
- The mean score and Mean percentage of mother stress level was
- The Mean score of stress level of mother regarding sights and sounds, baby looks, behaves and treatment, Relationship with baby and parenting role, Staff behavior and communication.

3. Findings related to association between mother stress level with selected demographic variables:

The association between selected demographic variables (such as age of mother, religion, occupation, education, family income in a month, type of family, place of residence, number of children, age of neonate, gender, birth weight, mode of birth, diagnosis, gestational age of mother at the time of delivery, birth order of the neonate, duration of hospital stay on the day on data collection, neonate is on ventilator/Bipap/Cpap/cardiac monitor/any congenital anomalies.

- Chi square value of stress level and occupation of mother was 12.59 which was statistically significant at df=6 and 0.05 level of significance. (p value= 0.01)
- Chi square value of stress level of stress of mothers and age of neonates was 13.57 at df = 4 and 0.05 level of significance. (p value = 0.007)
- Chi square value of level of stress and diagnosis of neonates was 19.21 at df = 8 and 0.05 level of significance. (p value = 0.009)
- Chi square value of level of stress and gestational age of mothers at the time of delivery was 6.49 at df = 2 and 0.05 level of significance. (p value = 0.03).

Discussion

Discussion related to level of stress of mothers of neonates admitted in Neonatal Intensive Care Unit:

In the present study 79.6% had moderate stress, 9.4% had high stress, 11% has low stress level of mothers of neonates admitted in Neonatal Intensive Care Unit.

The findings of the present study was supported by the study conducted by K, Kumar, Kumar V, J.S, S, P, there 70% were belongs to moderate stress level of mothers in Neonatal Intensive Care Unit [4].

Another study conducted by Subhashini L, M, R the presented study revealed that 76.6% parents had moderate stress level,23.3% parents have mild stress level [5].

A study conducted by Das M, Das k considered that overall stress level of mothers was moderate in Neonatal Intensive Care Unit [6].

Study carried out by Ganguly R, Patanik L, Sahoo J, Pattanaik S revealed that 60.8% mothers had moderate to high stress level in neonatal intensive care unit [7].

Study carried out by Jogi S, Gurgani S, revealed that 85% of mothers had moderate stress level, 8.3% has severe stress and 6.7% had mild stress level [8].

Study carried out by R S, K S revealed that majority (63.33%) of mothers have moderate stress level when their neonates admitted in NICU [9].

- The study revealed that general stress was highest for mothers. The subscale in which high stress appeared in the domain of relationship with baby and parenting role. Low stress was present in the domain of staff behavior and communication.

Study conducted by Shriber L D revealed that a feeling of general stress was highest for parents. The subscale in which they reported their greatest stress was in the relationship with baby and parenting role area. Parents experienced a little to a moderate degree of stress regarding now their looks and behaves. The sights and sounds of the unit caused only a little stress and the area of staff behaviors and communication was not at all stressful [1].

Discussion related to association between level of stress of mothers of neonates admitted in Neonatal Intensive Care Unit:

- In the present study the level of stress was significance association between level of stress of mothers and occupation of mothers of neonates ($\chi 2$ (df 6) = 12.59) at 0.05 level of significance.

This finding was congruent with the findings of the study conducted by M R which showed a significant association between level of stress and occupation of mother ($\chi 2$ = 10.65, p<0.01) at 0.01 level of significance.

The findings were congruent with the findings of the study conducted by Vinod K P which showed a significant association between occupation of mother and level of stress [2].

KP Sudhana M conducted a study there revealed that there was a significant relationship between occupation and level of stress. There was no relationship between educational qualification of mother and level of stress ($\chi 2$=3.26, p value = <0.01) at 0.01 level of significance [18].

- In the present study there was no significant relationship between age of mother and level of stress ($\chi 2$= 1.84, df =4, p value = 0.77) at 0.05 level of significance. There was no significant relationship between religion of mother and level of stress ($\chi 2$= 8.62, df =6, p value = 0.19) at 0.05 level of significance. There was no significant relationship between education of mother and level of stress ($\chi 2$= 3.28, df =8, p value =0.921) at 0.05 level of significance. There was no significant relation between income of family and level of stress of mothers ($\chi 2$= 1.41, df =4, p value = 0.85) at 0.05 level of significance.

There was no association between type of family members and level of stress ($\chi 2$=0.166, df =2, p value = 0.92) at 0.05 level of significance. There was no significant relationship between place of residence ($\chi 2$=3.57, df =2, p value = 0.16) at 0.05 level of significance. There was no significant relation between number of child and level of stress of mothers. ($\chi 2$= 2.63, df =4, p value = 0.62) at 0.05 level of significance.

Similar study conducted by R M there was no significant relationship between age of the mothers, educational status, monthly income, religion, area of living, number of children at 0.01 level of significance [19].

Mulla A conducted a study there was no significant relation between level of stress and demographic variables like age, religion, education, type of family, place of residence at 0.05 level of significance [15].

Subhashini L, M S R conducted a study where there was no significant association between level of stress and age of parents, religion, education, type of family, number of children, previous exposure to stress at 0.05 level of significance [5].

Das K, Das M conducted a study there was no significant relationship between age of neonate and level of stress ($\chi2$= 8.590, df =6, p value = 0.198) at 0.05 level of significance. There was no significant relationship between religion and level of stress ($\chi2$= 3.859, df =2, p value = 0.14) at 0.05 level of significance. There was no significant relationship between education and level of stress ($\chi2$= 14.75, df =8, p value = 0.064) at 0.05 level of significance. There was no significant relationship between family income and level of stress ($\chi2$= 12.87, df =10, p value = 0.064) at 0.05 level of significance. There was no significant relationship between place of residence and level of stress ($\chi2$= 3.25, df =2, p value = 0.196) at 0.05 level of significance. There was no significant relation between number of child and level of stress. ($\chi2$= 1.687, df =4, p value = 0.793) at 0.05 level of significance [6].

Jogi S, Gurgani S conducted a study there revealed that there was no significant association between age of mothers and level of stress ($\chi2$= 2.460, df =4, p value = 0.652) at 0.05 level of significance. There was no significant relationship between education and level of stress ($\chi2$= 5.742, df =6, p value = 0.453) at 0.05 level of significance. There was no significant relationship between place of living and level of stress ($\chi2$= 2.667, df =2, p value = 0.264) at 0.05 level of significance. There was significant relationship between type of family and level of stress ($\chi2$= 1.940, df =2, p value =0.379) at 0.05 level of significance [8].

K P Sudhana M conducted a study there revealed that there was no relationship between age of mother and level of stress ($\chi2$= 0.39, p value = 0.53) at 0.01 level of significance. There was no relationship between educational qualification of mother and level of stress ($\chi2$=0.79, p value = 0.67) at 0.01 level of significance. There was no relationship between family income and level of stress ($\chi2$=3.26, p value = 0.07) at 0.01 level of significance. There was no relationship between area of living and level of stress ($\chi2$=0.56 p value = 0.45) at 0.01 level of significance. There was no relationship between religion of mother and level of stress ($\chi2$=1.87 p value = 0.39) at 0.01 level of significance. There was no relationship between number of children and level of stress ($\chi2$=1.61 p value = 0.21) at 0.01 level of significance [18].

- There was no significant relationship between level of stress and gender of neonates. ($\chi2$= 3.47 df = 2, p value = 0.176) at 0.05 level of significance. There was no significant relation between birth weight and level of stress of mothers ($\chi2$= 7.53, df = 4, p value =0.110) at 0.05 level of significance. There was no significant relationship between mode of birth and level of stress. ($\chi2$= 2.961, df = 2, p value =0.23) at 0.05 level of significance. There was no significant relationship between Apgar score and level of stress ($\chi2$= 6.298, df = 4, p value = 0.127) at 0.05 level of significance. There was no significant relationship between birth order of neonate and level of stress ($\chi2$= 2.634, df =4, p value = 0.62) at 0.05 level of significance. There was significant relationship between duration of hospital stay on the day of data collection ($\chi2$=2.168, df = 6, p value =0.91) at 0.05 level of significance. There was no significant relationship between Neonate is on ventilator/ BiPAP / CPAP /cardiac monitor/any congenital anomalies and level of stress. ($\chi2$= 4.94, df =2, p value = 0.08) at 0.05 level of significance.

Similar findings were found in the study R M where the investigator found that there was no relationship between age of the neonate (2= 3.17) at 0.05 level of significance, there was no relation between gender of neonate and level of stress ($\chi2$= 9.21) at 0.05 level of significance, there was no relationship between birth weight and level of stress ($\chi2$= 12.59) at 0.05 level of significance [19].

Mulla A conducted a study where there was no significant relation between level of stress and birth weight of baby, ordinal position, type of delivery, any illness /accidents present in neonate [15].

Das K, Das M conducted a study there a no significant relationship between birth order and level of stress ($\chi2$= 1.952, df =4, p value =0.745) at 0.05 level of significance. There was no significant relationship between duration of hospital stay and level of stress. ($\chi2$= 2.905, df =6, p value = 0.821) at 0.05 level of significance [6].

Jogi S, Gurgani S conducted a study there is no significant association between period of hospital stay of neonate and level of stress ($\chi2$=10.89, df =6, p value = 0.092) at 0.05 level of significance [8].

The findings were supported by a study conducted by Ganguly R, Patanaik L, Sahoo J, Pattanaik S, Sahu T revealed that there was no association between total parental stress and gender of neonate, birth weight, mode of delivery [8].

Hypothesis:

H_1: There is a significant association between level of stress of mothers and occupation of mothers of neonates at 0.05 level of significance

H_2: There is significance association between level of stress of mothers and age of neonates at 0.05 level of significance

H_3: There is significance association between level of stress and diagnosis of neonates at 0.05 level of significance

H_4: There is significance association between level of stress and gestational age of mothers at the time of delivery at 0.05 level of significance.

Conclusion

On the basis of the study it can be concluded that the overall mother stress level was moderate when their neonates admitted in Neonatal Intensive Care Unit. The study findings also revealed that the stress level of the mothers in the four domains namely sights and sounds, baby looks, behaves and treatment, relationship with baby and parenting role, staff behavior and communication and overall stress experience.

Declaration by Authors
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