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Full Length Research Paper

Relationships between parental demographic variables and parental stress over their hospitalized infants in NICU

Chiejina EN[1], Ebenebe RC[2] and Odira CC[1]

[1]Department of Nursing Science, Faculty of Health Sciences & Technology, Nnamdi Azikiwe University, Nnewi Campus, Nigeria
[2]Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University Awka, Nigeria

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This study examined the relationships between parental demographic variables and parental stress over their hospitalized infants in neonatal intensive care unit (NICU). The target population was 216 parents of high risk infants who were hospitalized in the NICU of two teaching hospitals in the South-East zone of Nigeria. Convenient sampling technique was adopted in the selection of the respondents. Two research questions and three null hypotheses guided the study. The instruments used for data collection were Parental Stressor Scale: Neonatal intensive care unit and Parental Self-report Scale. Parent-infant demographic information was also obtained for the study. Mean score, standard deviation (SD) and Spearman Rank Correlation Coefficient (rho) were used to answer the research questions while Chi-square, Wilcoxon and Mann-Whitney U tests were adopted in testing the null hypotheses at 0.01 level of significance. The result indicated significant correlation between parental age and parental stress over NICU staff behaviour/ communication. Significant differences were also observed in parental stress for the NICU sights and sounds as well as infant behaviour and appearance with regard to number of children born by parents and sex of the parents.

Keywords: Demographic Variables, Infants, NICU, Parental Stress.

INTRODUCTION

Medically fragile infants are born into families of all races, religions, nationalities and cultural backgrounds without regard for their social environment (Syder – Greenberg and Dokkin, 2000). As technology increases, smaller and more medically fragile infants are being treated and kept alive in highly technical neonatal intensive care (NICU) environments (Miles et al, 1993).

From birth, the child has an ability to respond to the environment which influences the interaction between mother and child (Wigert et al, 2006). In typical circumstances, the parent-infant bonding process that occurs during the newborn period establishes the foundation for a lifelong relationship. However, this typical process does not necessarily occur when the infant is born at risk, and spends the first several weeks or months in the NICU (Case-Smith, 1993). If this attachment is interrupted, the child's emotional development is negatively influenced (Wigert et al, 2006).

Neonatal Intensive Care Unit (NICU) environment has the potential to exacerbate stress for parents of infants admitted to the unit. NICU stressors, individually or in combination, may interfere with the parent-infant relationship and create extra difficulties for the couple

*Corresponding author Email: nkechichiejina@yahoo.com

and wider family (Carter et al, 2007).

When parents have an infant in neonatal intensive care, they bring with them their own unique characteristics and set of circumstances. While in the NICU, parents are also influenced by the specific situational conditions of their infants. According to Miles and Carter (1983), these conditions can include the severity of their infant's diagnosis, the infant's appearance and level of functioning, and the duration of their infant's stay in the unit. Environmental factors that can influence parents' unique reaction to having an infant in the NICU might include difficulty in fulfilling their parental role, the medical equipment used for intervention, and the communication patterns and behaviour of the staff (Miles and Carter, 1983; Hunter, 2001). Miles and Carter (1983) explained that as a result of the various factors that can influence the parents, each parent develops his or her own way of cognitively appraising, or making judgments about the NICU experience. For example, some parents, may view their situation as positive since their infant is getting the care he or she needs, others may see it as negative when the infant or staff is unable to correspond to their expectations or needs, some parents may cope by using the environmental resources available to them such is the support of the NICU staff, while others may use personal resources such as family, friends or financial assets. Hence, the response to the stress of having a child in the NICU can therefore be the result of a complicated interaction of various variables that can potentially be adaptive or maladaptive. Increased information about how parents of hospitalized high-risk infants perceive NICU, and also an understanding of the needs of such parents may enable NICU Staff to identify parents at risk and plan interventions to meet those needs and promote family functioning. This is particularly important given evidence that factors such as parental well-being, family cohesion and parent-child relationships make significant contributions to infant longer-term developmental outcomes (Carlson et al, 2003; Elgar et al, 2004; Martins and Gaffan, 2000). This study was therefore intended to determine how parental demographic variables influence the stress experienced by parents of hospitalized high-risk infants in the NICU.

Research Questions

* How do age of parents of hospitalized infants in the Neonatal Intensive Care Unit relate to the stress experienced by the parents over the behaviour and communication pattern of the hospital staff?
* How do age of parents of infants in the NICU relate to the stress experienced by parents over the sights and sounds in the unit?

Hypotheses

* Number of children born by parents do not significantly relate to the stress the parents experience over the sights and sounds in the NICU where their infants are hospitalized.
* Significant difference does not exist in the marital status of parents with regard to their role alteration over their hospitalized infants in the NICU.
* Significant difference does not exist between male and female parents with regard to the stress experienced by parents over the behaviour and appearance of their hospitalized infants in the NICU.

MATERIALS AND METHODS

Design and Sampling

The study was a correlational research design. A convenient sample of 216 parents (mothers and fathers) of high-risk infants who were hospitalized in the NICU of two Teaching Hospitals in South-East Zone of Nigeria was used for the study.

Ethical approval was obtained for the study and informed consent was obtained from the parents. Inclusion criteria for the study were parents of the preterm babies and neonates with other illnesses (like asphyxia, birth injuries, congenital malformations, Jaundice, etc) that necessitated their admissions into the unit for special care. Parents who indicated not to participate were excluded from the study, and also their infants were not used. The parents were approached at various points within their infants' hospitalization. To obtain data on stress, the researchers approached the parents at a time when they were visiting but not holding their babies, and when not involved with other NICU personnel. Copies of the Questionnaires were administered at that time as well. For their information to be included in the study, their infants had to remain in the NICU for at least 24 hours. Confidentiality was ensured by not including names of the respondents in data collection. Rather code numbers were used instead of names.

Instrument

Parental Stressor Scale: Neonatal Intensive Unit (PSS-NICU) developed by Miles and Funk (1987) and designed to measure the parents perception of stressors within the NICU was used by the researchers in this study. The scale consists of four sub-scales that measure stress related to sights and sounds (eg presence and noise of monitors and equipment, other sick babies, alarm noises,

large number of staff), appearance and behaviour of the infant (eg tubes and equipment on, in or near the infant, infant color, size, cry, movements, labored breathing), the impact on parents' role and their relationship with their babies (eg being separated from their infants, unable to feed and care for the infant, fear of touching or holding the baby, feeling helpless to help the infant), and the parents' relationship and communication with the staff (eg. Staff explaining things too fast, not enough information, staff looking worried about infant or not understanding).

Additional questionnaire items adopted from Abdin's (1995) Parenting Stress Index (PSI) were added to the questionnaire sub-scales of infant behaviour and parental role alteration. For example, items like distractibility/ hyperactivity, nil-adaptability, nil-reinforcement of parents, demandingness, mood and nil-acceptability were added to the questionnaire items of Infant Behaviour subscale, while items like incompetence, isolation and non-attachment were added to the subscale of parental role alteration. The responses to the PSS:NICU were scored on a 5-point Likert scale ranging from 1point for "not at all stressful", 2 points for "mild stress", 3 points for "fairly moderate stress", 4 points for "very stressful" and 5 points for "extreme/ severe stress". Higher scores indicate more stress.

Another instrument (questionnaire) on Parental Self-report Scale on the coping measures parents adopt, alterations in mood (such as sad always, grief, anxiety, depression), concern about infants' outcome, involvement in decision-making as a measure to reduce stress and spouse presence in stress reduction was used for the study. The responses were rated on a 4-point scale ranging from 1 point for not at all, 2 points for fair, 3 points for much and 4 point for very much. Higher scores for this indicate more coping abilities for the parent.

A parent – Infant Demographic sheet was constructed for the study by the researchers to obtain information on the parent and infant characteristics that might contribute to, or be predictive of the different stress responses among the parents. These data were obtained confidentially from the medical files and included information on the parents' gender, age, marital status, ethnicity, education and occupation. Data collected on the infants demography included their gestational age, birth weight, diagnosis and length of stay.

Internal consistency reliability coefficients were calculated using cronbach's alpha for the entire scales. 20 parents of hospitalized infants in the NICU of a teaching hospital in another zone in Nigeria were used. The internal consistencies for the entire scales were 0.76 and 0.65 respectively.

Data Analysis

Standard descriptive statistics like means, frequency, and standard deviation were used to summarize the independent variables and the PSS: NICU total and four subscales. Mean score, standard deviation and spearman Rank coefficient was used to answer the research questions. Mann-Whitney U, Wilcoxon and Chi square statistical tests were used to test the null hypotheses at 0.01 level of significance. SPSS version 21 was used in the data analysis.

RESULT

Demographic characteristics of the study population are shown in table 1.4.6% of the respondents were males while 95.4% were females. The single parents constituted 2.8% while the married ones were 97.2% of the population. Majority of the respondents (84.7%) were Ibos, Hausas were 3.2%, Yoruba 4.6%, Ijaw 1.9%, Edo 2.8%, Tiv 2.3% and Langthang 0.5%. Majority of the respondents (56%) had secondary education while 2.8% were illiterates, 27.3% had tertiary education while 13.9% were of primary school level. 67.6% were business men and women, 12.0% were civil servants, 11.1% were professionals and 9.3% were artisans. 74.5% had all their children alive, 20.4% had some of their children alive while 5.1% had none alive. With regard to the respondents' fertility history, 89.4% were fertile prior to childbirth while 10.6% had fertility treatment prior to childbirth. Among the NICU infants of the respondents, 61.1% were males while 38.9% were females; 31% constituted first child, 27.8% second child, 40.7% third child and 0.5% above third child. For the infants' length of stay in the hospital, 46.8% spent few days while 53.2% spent long period. The respondents' total population was 216.

Table 2 shows the descriptive statistics of the measured variables. Out of the 216 respondents, the mean age was 29.9352 with standard deviation (SD) of 5.87509, mean for number of children born by the respondents (the parents) was 2.6944 with SD of 0.56170, mean value of infant gestational age 35.2130 with SD of 5.73370; mean for the infants' birth weight 2.6160 with SD of 0.97483. Parental stress (PSS) for NICU sights and sounds has mean score of 2.5718 with SD of 0.81058, mean of PSS for NICU infant behaviour and appearance was 2.9213 with SD of 0.86783, mean of PSS for NICU staff behaviour and communication 2.6139 with SD of 1.06251, mean of NICU parental role alteration 3.0728 with SD of 1.08000, while the mean of NICU parental self-report coping measures was 3.2407 with SD of 0.51870.

Table 3 shows that the rho correlational value for the relationship between age of parents of infants in NICU and parental stress over NICU staff behaviour and communication pattern was 0.165. The critical value was 0.008. The correlation was significant at 0.01 level.

In table 4, the rho correlational value for the

Table 1 Demographic Characteristics of the Study Population

Variable	Frequency	Percentage
Parental sex:		
Male	10	4.6
Female	206	95.4
Parental Marital Status (MS):		
Married	210	97.2
Single	6	2.8
Parental Ethnicity:		
Ibo	183	84.7
Hausa	7	3.2
Yoruba	10	4.6
Ijaw	4	1.9
Edo	6	2.8
Tiv	5	2.3
Langthang	1	0.5
Parental Educational Level:		
Illiterate	6	2.8
Primary	30	13.9
Secondary	121	56.0
Tertiary	59	27.3
Parental Occupation:		
Artisan	20	9.3
Business	146	67.6
Civil Servant	26	12.0
Professional	24	11.1
Number of Children:		
None alive	11	5.1
Some alive	44	20.4
All alive	161	74.5
Fertility History of the Parents:		
Infertile Prior to Child birth	23	10.6
Fertile Prior to Child Birth	193	89.4
Infant Sex:		
Male Child	132	61.1
Female Child	84	38.9
Infant Position:		
First Child	67	31.0
Second Child	60	27.8
Third Child	88	40.7
Above third Child	1	0.5
Infant Length of stay in Hospital:		
Few Days	101	46.8
Long Stay	115	53.2

Total Population N = 216

relationship between age of parents of infants in NICU and parental stress for the Sights and Sounds in the NICU was 0.013. The critical value of 0.422 was more than the rho correlational value indicating absence of correlation.

Table 5. shows that the calculated X^2 of 10.454 was more than the critical value of 0.005 at 0.01 level of significance. Therefore number of children born by parents is significantly related to parental stress for the Sights and Sounds in NICU. The null hypothesis is rejected.

Table 6. shows that the calculated Z score of 0.153 was less than the critical value of 0.879. There is no significant difference between the married and single parents with regard to parental role alteration for their infants in NICU. The null hypothesis is accepted.

At 0.01 level of significance, the Z-cal of 1.345 was more than the critical value of 0.179 (table 7). There is significant difference between male and female parents with regard parental stress for the behaviour and appearance of the infants in NICU. The null hypothesis is therefore rejected.

DISCUSSION

Findings from the study indicate significant correlation between age of the parents of infants in NICU and

Table 2 Descriptive Statistics of the Measured Variables

Variable	N	Mean	SD
Parental Age	216	29.9352	5.87509
Number of children born by Parents	216	2.6944	0.56170
Infant Gestational Age	216	35.2130	5.73370
Birth Weight of Infant	216	2.6160	0.97483
PSS for sights and sounds in NICU	216	2.5718	0.81058
PSS for NICU Infant behaviour and Appearance	216	2.9213	0.86783
PSS for NICU Staff Behaviour/ Communication	216	2.6139	1.06251
NICU Parental Role Alteration	216	3.0728	1.08000
NICU Parental Self-report coping Measures	216	3.2407	0.51870
Valid N (Listwise)	216		

Table 3 Relationship between age of parents of Infants in NICU and Parental Stress for NICU staff behaviour and communication pattern

Variables	N	$\bar{X}$	SD	Rho	Critical value	Level of significance
Parental age	216	29.9352	5.87509	** 0.165	0.008	0.01
PSS for NICU Staff Behaviour and Communication	216	2.1639	1.06251			

**Correlation is significant at 0.01 level (1-tailed).

Table 4 Relationship between age of parents of infants in NICU and parental stress for the sights and sounds in NICU

Variables	N	$\bar{X}$	SD	Rho	Critical value	Level of significance	Remark
Parental age	216	29.9352	5.87509	0.013	0.422	0.01	No correlation
PSS for NICU Sights and Sounds	216	2.5718	0.81058				

Table 5 Chi-Square test comparison of the number of children born by parents and Parental Stress for the Sights and Sounds in NICU

No of Children	N	Mean Rank	Df	X^2-Cal	X^2-Crit	Probability
None Alive	11	154.23	2	10.454	0.005	P<0.01
Some Alive	44	123.05				
All Alive	161	101.40				
Total	216					

Table 6 Wilcoxon test comparison of NICU Parental role alteration among the married and single parents

Variable	Ranking Order	N	Mean Rank	Sum of Ranks	Z - Cal	Z-Crit	Probability
Marital status - NICU Parental Role Alteration	Married	210	108.61	22808.00	0.153	0.879	P>0.01
	Single	6	104.67	628.00			
	Total	216					

NB: Z – cal = standard score

parental stress for NICU staff behaviour and communication pattern (table 3). Although Busse et al (2013) reported absence of correlation between parental age and parental stress for the entire NICU atmosphere, Heidari, Hasanpour and Fooladi (2013) reported high correlation between parental age and parental stress towards the physicians and the nursing crew's approach to treatment. Carter et al (2007) reported significant negative association between NICU Staff Communications and behaviours score and young mothers of infants in NICU. Carter et al (2007) also noted that with regard to age, antidepressant treatment and anxiety were not surprising among the stressed parents. The perception of receiving inadequate information and

Table 7 Mann – Whitney U test comparison of parental stress for NICU Infant behaviour and appearance among the male and female parents

Variable	Ranking Order	N	Mean Rank	Sum of Ranks	Z– Cal	Z–Crit	Probability
Parental sex – PSS for NICU Infant Behaviour and Appearance	Male	10	82.55	825.50	1.345	0.179	P<0.01
	Female	206	109.76	22610.50			
	Total	216					

NB: Z – cal = standard score

high anxiety states in parents of NICU infants have been shown to negatively correlate with parental satisfaction and recall of information provided (Periman et al, 1991).

Findings from the study indicate absence of significant correlation between parental age and parental stress for the sights and sounds in the NICU (table 4). Busse et al (2013) reported similar findings among 30 parents whose infants were hospitalized in level III NICU. The implication of this finding is that eventhough the NICU Sights and Sounds provoke parental stress, the magnitude of the stress is not associated to the age limits of the parents.

The significant relationship between number of children born by the parents and the Stress experienced by parents over the Sights and Sounds in NICU (table 5) supports the findings of some researchers. Busse et al (2013) observed that having other children in the family was correlated with parental anxiety for NICU sights and sounds but the correlation was not significant. Having other children in the family could constitute psychological and social support to the parents of the NICU infants. Feldman (1999) stated that our relationships with the others also help us to cope with stress. Researchers have also found that social supports such as interested others enable us experience lower levels of stress and to be better able to cope with the stress we do undergo (Pierce, Sarason and Sarason, 1996).

The absence of significant difference between married and single parents with regard to NICU parental role alteration (table 6) is contrary to the findings in some studies. Carter et al (2007) reported pronounced NICU parental role alteration among single mothers. In addition, Miles, Funk and Kasper (1992) as well as Shields – Poe and Pinelli (1997) have demonstrated that separated or divorced parents have increased concern in this area.

Findings from the study also indicated significant difference between male and female parents with regard to the stress they experienced over the behaviour and appearance of their NICU infants (table 7). Carter et al (2007) noted that gender differences among the factors that contributed to NICU stress in parents were apparent in the total stress level including the behaviour and appearance of the infant. Colville et al (2009) found that mothers are more afraid than fathers over their infants' death.

CONCLUSIONS AND RECOMMENDATIONS

The study has shown that the demographic variables of parents have impact on the stress experienced by parents over their hospitalized infants in NICU.

The demographic variables of the parents are not exhausted in this study. Further studies are recommended on the impact of other demographic variables like parental educational level, ethnicity, occupation and fertility history.

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