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Research Article

COMPARING STRESS LEVEL IN PARENTS OF PREMATURE NEONATES HOSPITALIZED IN NEONATAL INTENSIVE CARE UNITS [NICU] IN EDUCATIONAL-MEDICAL CENTERS OF AHVAZ

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Abstract:

Objective: birth of premature and low birth weight baby is the most underlying factor of mortality during the first year of life. Paying attention to social-mental effective aspects of birth of premature baby in parents is also important. The main objective of this study is to compare the stress of fathers and mothers of premature babies hospitalized in NICUs of Ahvaz Educational-Medical Centers.

Method: the study is a descriptive-analytical research and the statistical population consists of all families of premature babies hospitalized in Abuzar and Imam Hospitals. 192 people of these families were selected as sample based on number of beds in each unit of hospital. The data collection was done using two questionnaires of demographic information and Parent Stressor Scale: neonatal intensive care unit [PSS: NICU]. Validity and reliability of the instrument was confirmed in similar studies. Data analysis was done using SPSS software.

Results: mean value and standard deviation [SD] of environmental factor is equal to [3.30±0.514] in fathers and to [3.81±0.532] in mothers. Independent t-test showed also significant difference between mothers and fathers [p<0.0001]. However, mean value and SD of the appearance and behavior of baby and parent role change showed respectively no significant difference between them using independent t-test [p=0.206] [p=0.175].

Conclusion: after birth of premature babies and hospitalization in NICU, parents experience high level of stress. Hence, it is necessary for the medical personnel to pay specific attention to the parents in addition to provide care for the babies.

Key words: *premature Neonates, NICU, family, stress*

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INTRODUCTION:

Nowadays, important part of material and spiritual sources of scholars is being spent on health of newborn babies and infants, since they are not only more vulnerable than other age groups, but also they play key role in providing social health [1]. Moreover, premature and low birth weight babies are at-risk class of the society. Moreover, because of their physiologic traits, they need fundamental care for survival and to gain normal growth process [2]. Statistics show that 5-15% of babies born at the world are premature and most of these cases are caused by multiple births [3]. In the study conducted by Gujani et al, spread of premature birth in Iran is reported to 7.1%. During the last years, advancement in neonatal medicine and pre-natal cares and maternity care, advanced mechanical ventilation methods, intravenous feeding and nursing cares have provided conditions for survival of babies with even very low weights and the sick babies [2]. Mostly, the awareness and knowledge of parents of premature babies in regard with their parenting function in NICU and their interaction with their babies is not enough and as a result of lack of inadequate relationship with the baby, they may encounter conflict, anxiety disorders, wrong imaginations in relation with the baby and future and inadequate parenting patterns. As a result, the intimacy and flexibility of parents as underlying factor in growth and well-being of baby is reduced; although premature babies need more supports and care for their growth and evolution [4, 5]. The space of NICU can intensify the stress of parents hospitalized there potentially for reasons other than premature and low birth weight childbirth. 4 underlying aspects relevant to NICU as stressful factors for parents include physical environment of NICU [advanced technologies such as flashing lights, ventilator alarms and monitors, placing babies in incubator, the tubes and monitors connected to baby and chemical odors in the unit [6] and complicated procedures], physical appearance and behavior of baby [sick and thin baby], interactions of parents and NICU personnel and change in parent role [7], which can change and disrupt normal tasks of parents as initial caregivers [8] and experience high level of depression and anxiety and psychological reactions such as disappointment, feeling guilty, distress, hostile reactions, fear, sadness and feeling lonely and no support to take the affairs [9].

Other studies have shown that lack of mother role is the most important stressful source in mothers [10]. The study conducted by Arockiasamy et al in this field showed that stress factor of mothers of babies in

NICU could be the sad appearance and pain of the patient [22]. On the other hand, stress in fathers happens in another way, since they are the first person meeting the baby in NICU after the birth and can be the key factor to support the mother and baby [11]. Hence, they feel that they have to accept new supportive role [12]. Routine medical cares can deprive father from understanding the situation and accepting the baby and fundamental parenting role [13]. Hussein et al have claimed that the difference of stressful factors based on gender [father or mother] shows that stress in regard with appearance and behavior of baby in mothers is more than fathers and it the stress in field of parenting role in fathers is more than mothers. However, the overall average stress in fathers is more than mothers [2]. However, in previous works, the fathers of babies hospitalized in NICU have gained less attention than mothers to meet their supportive needs and have been less supported socially and they experienced less stress than mothers in the NICU and in regard with change in parent role [9].

According to close relationship of nurses in NICU with babies and their parents, nurses can play key role in reducing the stress and distress of mothers and fathers. The main effective role of nurses could be family-centered function, so that through providing care for parents and helping reduction of their stress, nurses can improve role play of parents to gain health of their baby [14]. Family-centered caregiving is on this basis that the family is the main and the first source for support baby and is aimed at preserving the integrity of family and providing unique care for each baby [11]. With the identification of factors affecting stress of parents and providing knowledge for parents, nurses, students and nursing managers about these factors and planning to manage the factors, many complications of these stresses can be reduced and the stress can be prevented in other levels [levels 1, 2 and 3]. Identification of stressful factors by medical personnel such as nurses of relevant units [in close relationship with babies and parents] provides conditions to take more purposeful efforts and with more information to decrease stress and tension in NICU. In this regard, cases such as prediction of times for appointment of babies with fathers, providing conditions for presence of parents beside their baby [13], empowerment of parents through providing required information and providing conditions for their participation to give care to their babies in the new situation created [12]. Hence, through providing some powers for parents to make decision on their baby, their stress can be decreased to some extent.

Rasti et al conducted a study with the objective of determining educational needs of parents of babies hospitalized in NICU and found that majority of parents have not sufficient information about the babies and meeting these needs can help them to have better sense of control on conditions. Understanding these needs also helps the caregiving team to provide better services for parents and babies. However, it should be mentioned that this study has been a qualitative research and the results can't be generalized [14].

Therefore, as stress can affect the ability of parents and their coping with the conditions and identification of stress level and causes can be a motivation to form new strategies or create modify existing strategies to decrease stress. Also, gaining information in this field can help nurses provide required resources and services to reduce the stress in best way. The parents can also find effective ways through this to reduce their own stress and to cope with conditions. The present study has been conducted with the objective of comparing the stress level in parents of premature babies hospitalized in NICU of educational-medical Centers of Ahvaz, so that the stress can be reduced with the recognition and better understanding of various stressful factors.

METHODS AND MATERIALS:

This study is a descriptive-analytical research. After getting permission of ethics committee under ethics code [IR.AJUMS.REC.1395.666] and getting the introduction letter from the Research Deputy of university, the author referred to Imam Khomeini and Abuzar Hospitals and getting their agreement, the author referred to study area [NICU] and explained the goals in details and gained the agreement of relevant authorities to conduct the study. After that, the author presented the introduction letter and explained the goals and significance of research to the participants and explained that their information remain private. After getting their consent, they were persuaded to fulfill the questionnaire. In this study, the population consists of 96 families [96 mothers and 96 fathers- 79 families from Imam Khomeini Hospital and 17 families from Abuzar Hospital] of babies hospitalized in NICU of Imam and Abuzar Hospitals in Ahvaz in 2017 selected based on sample size formula using convenience sampling method and based on inclusion criteria including at least 3 days passed from hospitalization in NICU and parents live with each other. Moreover the exclusion criteria included refusing to fulfill the questionnaire completely.

To determine sample size, the findings of Husseini et al with the probability of type 1 error [α] 0.05 and test power of 0.80 are used.

$$n = \frac{(Z_1 - \alpha/2 + Z_1 - \beta)^2 (s_1^2 + s_2^2)}{(\bar{x}_1 - \bar{x}_2)^2}$$

$$Z_1 - \alpha/2 = \frac{1}{96} \quad \text{for reliability of \%95}$$

$$Z_1 - \beta = \frac{0}{84} \quad \text{for power of \%80}$$

$$\begin{cases} S_1 = 0/88 \\ S_2 = 0/75 \\ \bar{x}_1 = 2/83 \\ \bar{x}_2 = 2/5 \end{cases}$$

$$\frac{(1/96 + 0/84)^2 (0/88^2 + 0/75^2)}{(\bar{x}_1 - \bar{x}_2)^2} = 96 \text{ mothers and } 96 \text{ fathers}$$

For purpose of data collection, two questionnaires of demographic information and PSS: NICU questionnaires are used.

Demographic information questionnaire: the scale includes items about demographic information such as age, gender and educational degree.

Parental Stress Scale: NICU standard questionnaire: the scale was designed by Miles and Funk in 1998. The scale contains 34 items related to stressor factors. The scale covers 3 groups of factors: 1- the environment of NICU [6 items] 2- appearance and behavior of baby [17 items] and 3- parent-baby interactions and parental roles [11 items]. The questionnaire is a list of stressful experiences in parents. The scoring method is based on Likert scale: no stressful experience [0], no stress [1], very low stress [2], average stress level [3], high stress [4] and very high stress [5]. The range of scores varies from 0 to 170 and high values show stress of parents. To measure the parental stress, mean value is calculated. Mean value of 1-2.59 refers to low stress; 2.60-3.59 refers to average stress and 3.60-5 refers to high stress level. Validity and reliability of the scale is estimated in similar study conducted by Husseini et al and validity of the scale is obtained to 85% and reliability is obtained to 88% [2]. Then, demographic information questionnaire and PSS: NICU were distributed among the participants and the parents fulfilled the questionnaires in presence of the author. While fulfilling the questionnaires, the author answered all probable questions of parents about the items. It should be mentioned that if the parents were illiterate, the authors asked the questions orally and

inserted their answers in the questionnaire. After data collection, the data were entered to SPSS-22 software and were processed. To compare the quantitative variables between two groups [fathers and mothers], independent t-test was used and to test qualitative variables, chi-squared test was used. In this study, to observe the ethics during the study time, the author received the permission of Complementary

Educations of the University and Management of Imam and Abuzar Hospitals and introduced herself to the personnel and families and explained the research purposes and reminded that they have not to mention their name and participation in the study is optional and has no effect on the treatment procedure of their baby.

RESULTS:

Table 1: frequency distribution and percent of studied units based on parents' demographic information

Parents' demographic information	RENG	Number	Frequency percent
Education level	Illiterate	14	7.3
	Diploma	104	54.2
	Post-diploma and BA	54	28.1
	MA and higher	20	10.4
Income level	Less than adequate level	67	34.9
	In adequate level	95	49.5
	More than adequate level	30	15.6
Parents' age	<20	24	12.5
	20-25	65	33.9
	26-30	77	40.1
	>30	26	13.5
Hospital	Abuzar	50	26
	Imam	142	74
Father's job status	Governmental	76	79.16
	Unemployed	8	8.30
	Self-employed	12	12.5
Mother's job status	Self-employed	9	67.7
	Governmental job	22	22.91
	Housewife	65	9.5

In this table, the highest frequency of education level of parents is belonged to diploma [54.2%]. 49.5% of parents had income level in adequate level. In regard with age, 40.1% of parents were in age range of 26-30 years old. 74% of babies were hospitalized in Imam Hospital. 79.6% of fathers are employed and 67.7% of mothers are housewives [table 1].

Table 2: measurement of stress level of parents with stressful factors

Factors	Parent gender	Number	SD ± mean	P
Environmental	Male	96	3.30±0.514	0.000
	Female	96	3.81±0.532	
Baby appearance and behavior	Male	96	3.33±0.388	0.206
	Female	96	3.40±0.388	
Parental role change	Male	96	3.35±0.481	0.175
	Female	96	3.26±0.464	

Mean value and SD of environmental stressful factors in fathers was equal to 3.30 ± 0.432 and it is equal to 3.81 ± 0.532 in mothers and the statistical test of independent t-test showed significant difference between mothers and fathers [$p=0.000$]. Moreover, mean value and SD of the stressful factor of appearance and behavior of baby is equal to 3.33 ± 0.388 in fathers and to 3.40 ± 0.388 in mothers. Independent t-test showed no significant difference between mothers and fathers in this field [$p=0.206$]. In addition, mean value and SD of the stressful factor of parental role change was equal to 3.35 ± 0.481 in fathers and to 3.26 ± 0.464 in mothers and independent t-test shows no significant difference between mothers and fathers in this field [$p=0.175$] [table 2].

Table 3: measurement of mean value and SD of relevant items of environmental factor

Stressful factor	Items	Mean	SD	P
Environmental	Monitor and special equipment in NICU	3.5	0.7	0.000
	Monotone alarm sound	3.74	0.95	
	Immediate sound of monitor alarm	2.5	1.03	
	Presence of other babies in NICU	2.26	0.66	
	Crowded space of NICU	3.00	1.22	
	Connection of mechanical ventilation device to baby	3.63	0.99	

Significant difference was observed between items of environmental factor using independent t-test [$p=0.000$]. Moreover, Monotone alarm sounds with mean value of 3.74 ± 0.95 has been the item with highest frequency in parents [table 3].

Table 4: measurement of mean value and SD of relevant items of appearance and behavior of babies

Stressful factor	Items	Mean	SD	P
Appearance and behavior of baby	Small body of baby	2.50	1.00	0.206
	Weak and wrinkled body of baby	2.25	0.66	
	The teeth and tubes attached to my baby's body	3.00	1.22	
	Intravenous feeding or through gastric catheter	3.63	0.99	
	Seeing baby in pain	3.13	1.05	
	Weak and unconscious appearance of baby	2.13	0.33	
	Weak body of the baby	3.38	0.48	
	Fast and sudden movements of baby	3.38	0.49	
	Different crying sound of baby from others	2.75	0.83	
	Severe and prolonged crying	3.25	0.82	
	Seeing the fear of baby	3.38	0.99	
	Seeing sudden color change of baby	3.00	0.86	
	Seeing stopped breathing of baby	3.11	1.05	
	Tubes, wires and equipment connected to baby's body or around the baby	3.13	1.05	
	The wounds and bruises on baby's body for injections and treatment	2.13	0.33	
Abnormal breathing of babies	3.75	0.97		
Abnormal color of babies	3.50	0.72		

Significant difference wasn't observed among items of appearance and behavior of baby using independent t-test [$p=0.206$]. Moreover, Abnormal breathing of babies with mean value of 3.75 ± 0.97 has been the item with highest frequency of the factor of baby appearance and behavior [table 4].

Table 5: measurement of mean value and SD of relevant items of parental role change factor

Stressful factor	Items	Mean	SD	P
Parental role change	Lack of caregiving by mother	3.5	0.86	0.175
	Inability to take care of my baby whenever I want	3.88	0.92	
	Feeling inability to help improvement of conditions of my baby during hospitalization	3.00	1.32	
	Lack of enough time to be alone with my baby	3.75	0.66	
	Sometimes I forget what my baby looks like	2.75	1.09	
	Lack of support of family members to care after my baby	2.25	0.97	
	Fear of touching or hugging my baby	3.13	1.45	
	Closeness of personnel to my baby more than myself	3.00	1.01	
	Lack of breast feeding	2.88	0.60	
	Being separated from the baby	3.13	1.27	
	Feeling unable to support my baby while doing painful work	2.75	0.43	

Significant difference wasn't observed among the items of the parental role change factor using independent t-test [$p=0.175$]. Moreover, "inability to care after my baby whenever I want" with mean value of 3.88 ± 0.92 has been the item with highest frequency in regard with the parental role change factor [table 5].

DISCUSSION:

Childbirth is an exciting event for parents and can be along with happiness and lots of other emotions. Unexpected birth of a premature or sick baby can stop the happiness and replace anxiety and worry. Emotions of parents under such conditions are uncertain and they feel distress as a parent because of lack of expected caregiving role. Concern and worry for health and survival of the infant, the pressure caused by the space of NICU and sense of doubt in self-confidence to take care of infant is common in these parents. Type and level of parental stress with premature or sick baby is different and it is depended on the level of their understanding of severity of the disease [2]. The results of this study on determining the stress level of mothers of premature babies hospitalized in NICUs of Ahvaz Educational-Medical Centers showed that mean value and SD of environmental stressful factor is equal to 3.81 ± 0.532 and it is equal to 3.40 ± 0.388 for the factor of baby's appearance and behavior and equal to 3.26 ± 0.464 for the parental role change factor. The factor with highest frequency in mothers is environmental factor. In the study conducted by Tandberg et al [2013] on 82 parents of premature babies, the parents experienced high level of stress respectively caused by appearance and behavior of baby and parental role change and ultimately, environmental factors [16], which are inconsistent with findings of this study. In the study conducted by Valizadeh et al [2009] on stressors affecting mothers in NICU, the stressful sources were respectively named as parental role change, baby appearance and behavior and then, environmental factors. The different result can be caused by different management and decoration of NICU in different areas. Moreover, the difference may be caused by this issue that personnel in NICU have failed to control environmental stressors [11]. Study conducted by Sadat Husseini et al [2016] on analysis of stressful factors for parents of premature babies hospitalized in NICU showed that the parents of these babies experience average level of stress and counted stressful factors respectively as environmental factors, parental role change and appearance and behavior of babies [3].

In regard with determining stress level of fathers of premature babies hospitalized in NICU of educational-medical centers of Ahvaz, the results showed that mean value and SD of environmental stressful factors is equal to 3.30 ± 0.514 , it is equal to 3.33 ± 0.388 for appearance and behavior of baby and is equal to 3.35 ± 0.481 for the parental role change. The study conducted by Tafti et al [2016] on analysis of the level and causes of stress in parents of

premature babies hospitalized in NICU showed that mean value of stress in mothers was equal to 152.65 [6.83] and is also equal to 136.82 [5.64] in fathers and independent t-test showed significant difference between fathers and mothers in terms of stress level [$p < 0.001$]. Moreover, the stress caused by appearance and behavior of baby in mothers was more than fathers and the stress caused by parental role change and interaction with baby in fathers was more than mothers and independent t-test showed significant difference [18]. The cause of significant difference between stress level of mothers and fathers can be associated with this issue that mothers specify predetermined expectations as a result of their emotional relations in pregnancy and the emotions are empowered as a result of birth of premature baby and hospitalization in NICU and their role as parent is destroyed at point and ultimately, they tolerate high stress level [6].

In regard with determination of stressful factor type of parents of premature babies hospitalized in the NICUs of studied hospitals, the results showed that among the items related to stressful factors caused by the environment of NICU, abnormal breathing of baby [3.75 ± 0.97], monotone alarm sound [3.74 ± 0.95], mechanical ventilation device attached to baby [3.63 ± 0.99] have respectively experienced most environmental stressful factors. In this field, study of Barimnejad et al [2011] showed that the relevant cases of stressful factors caused by the environment of NICU, existence of ventilation device for babies [27.9] sudden tone of monitor alarm [25.7] and special monitors and equipment [17.1] are respectively the most stressful environmental factors [19]. At the present study, among relevant factors of appearance and behavior of baby in NICU, intravenous or gastric catheter feeding [3.63 ± 0.99], weak appearance of baby [3.38 ± 0.48], separation of mother from her baby [3.13 ± 1.27] are respectively the most stressful factors associated with baby's appearance and behavior. In this field, the findings of Barimnejad et al [2011] showed that among the appearance and behavioral factors of baby, stopped breathing of baby [70.7%], sudden skin color change [55%], pain of baby [47.9], weak appearance of baby [36.4], abnormal breathing pattern of baby [36.4%] have been respectively the most underlying stressful factors associated with baby appearance and behavior [19]. At the present study, among factors related to stressful factors caused by parental role change, inability to care after the baby [3.88 ± 0.92], lack of enough time to be alone with baby [3.75 ± 0.66], lack of support of family members to care after the baby [2.25 ± 0.97] have been respectively the most

underlying stressful factors in field of parental role change. In this regard, findings of Barimnejad et al [2011] showed that among the items related to parental role change, separation from the baby [69.3], lack of breast feeding [59.3], feeling unable to care after the baby and painful treatment methods [60.7%], feeling helplessness to support baby in painful conditions [53.6%] are respectively the most underlying stressful factors in field of parental role change [19]. According to the results obtained from the present study, it could be mentioned that the highest mean value and SD of 3 domains of stressful factors for mothers in NICU has been respectively belonged to environmental factors, baby's appearance and behavior, baby-parent relationship and parental roles. The results obtained from Friedman test showed significant difference of stressful domains for mothers in NICU. In this field, the findings of Frank et al [2005] showed that physical environment of NICU is a source of stress for parents. Seeing their babies connected to equipment, tubes and wires surrounded by personnel can be concerning for the parents. Hence, it would be better for parents, especially mothers with high risk pregnancy, to visit the NICU before their childbirth and delivery or get at least some explanations about the NICU environment while visiting the unit after reception of their baby. The explanations include the alarm of devices, traffic of personnel, unit's equipment, ventilators, intravenous tubes and monitors [20].

Moreover, as the highest mean value and SD of 3 domains of stressful factors for fathers in NICU are respectively belonged to parent-baby relationship, parental roles, appearance and behavior of baby and environmental factors, the results obtained from Friedman test showed significant difference between stressful domains in NICU for fathers. In this field, findings of Barimnejad et al showed that in regard with baby-oriented stressful factors, separation from baby, lack of breast feeding by mother, feel unable to protect the baby against pain and painful treatment methods and feeling helplessness in field of helping the baby while painful conditions are respectively the most underlying stressful factors. Some studies have revealed that separation from the baby is another stressful item for mothers. Usually after childbirth, premature babies are transferred to NICU for the preliminary measures and the short time between birth and the first appointment may reduce stress of parents [17]. Study conducted by Frank et al showed that the most underlying stress source reported most of the times by parents can be losing the desired parental role. In fact, parents feel disappointment, since they can't act based on their parental duties.

Moreover, they mention high level of stress and disappointment against their inability to protect their baby against the damages and pains [20].

CONCLUSION:

Premature childbirth and ultimately, hospitalization of these babies in NICU can be stressful for parents and necessity of considering stressful factors and reducing these factors by managers and nurses of hospitals can be felt. In such environments and spaces, some measures should be taken to provide comfort and welfare of parents. Moreover, it would be better to provide some information about the NICU and personnel and medical personnel for the parents of these babies before hospitalization, so that they experience lower level of stress about the environment. On the other hand, with the participation of parents in treatment procedure, higher quality care can be provided for the babies and families.

Applying research results in clinic

According to the results obtained from this study and many relevant works, paying attention to stressful sources for parents of premature babies is vital and identification of factors affecting stress of parents and predicting that is required for the plans of custodians of healthcare and nurses can take efficient step in field of supporting parents of premature babies through emphasizing these factors.

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