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Original Article

The effect of neonatal intensive care unit orientation program on decreasing the anxiety of premature infants mothers

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ABSTRACT

Background & Aim: High levels of anxiety in mothers after the birth of a premature infant and its negative effects and consequences on the infant and the family indicate the necessity of performing an intervention for them. This study was conducted to evaluate the effect of neonatal intensive care unit orientation program on the anxiety of premature infants' mothers in Shahrekord**.**

Methods & Materials: In this semi-experimental non-equivalent controlled study which was conducted in 2015, 64 mothers of premature infants were enrolled who were allocated into two groups of control and intervention. Participants of the intervention group participated in three 30-minute face-to-face unit orientation educational program. Data were gathered using the Spielberger's State-Trait Anxiety Inventory that has 40 questions and were analyzed using central indices, dispersion, Kolmogorov-Smirnov test, Chi square, Fisher's exact test, independent t-test and Mann-Whitney test.

Results: The mean score of anxiety of the mothers had no significant difference between the control group (102.16 ± 4.72) and the intervention group (100.12 ± 1.66) before the intervention ($p > 0.05$). The mean score of both groups still had no significant difference after the intervention ($p > 0.05$). Also comparing the mean score of the trait anxiety and the situational anxiety subgroups between both groups before and after the intervention showed no significant difference ($p > 0.05$).

Conclusion: Considering the ineffectiveness of the neonatal intensive care unit orientation program on the anxiety of mothers, it seems that this method could not decrease mothers' anxiety on its own. Therefore it is necessary to evaluate the effect of other interventions on the anxiety of premature infants' mothers in future studies.

Introduction

Having an ill infant would cause severe mental crisis for the parents (1, 2). One of the most common causes for hospitalization of the infant in neonatal intensive care unit (NICU) is premature birth (3). Unfortunately, despite all the efforts to prevent preterm deliveries andbirth of premature and low-weight infants, still the number of these infants is high (4); 15 million premature infants would be birthed annually around the world which would make up more than 16% of all the born infants in the world (5). The birth of premature infant would lead to early separation from the mother and lingered hospitalization in the NICU which could hurt the mother (6).

Parents are poorly prepared for encountering the shock, tension and anxiety caused by the birth of a premature ill infant who has to be hospitalized in the NICU; the birth of a premature ill infant could risk the transition to the parental period (7, 8). Approximately, 28 to 70% of premature infants' mothers would experience high

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levels of mental pressure (9). Tolerating this pain and mental pressure would cause the mother not to participate in infant's cares and consequently, they would feel incompetence, anxiety, high levels of depression and change in parental roles (1, 10).

Ignoring the emotional and mental tensions of parents would decrease their attachment to their infant by the time of discharge and this would increase the vulnerability of the infant and the parents (11, 12). Providing mental relaxation for the parents could increase mother's ability in providing sufficient care and support for her infant. Solutions such as understanding the concerns and stressful events and hence designing appropriate interventions could be helpful in providing high quality care for the child (13). Results of a study by Turan et al (2007) showed that orientation program has been significantly effective on decreasing the stress of premature infants' mothers (14). Also, the study of Bastani et al showed that mothers' participation in caring for their premature infant has been effective in decreasing their situational anxiety (15). The study of Ghodrati et al in 2014 revealed that neonatal care training could decrease the anxiety among mother with premature infants (16). The study of Chen et al in 2002 resulted that cooperative-educational program about taking care of the infant for the parents would decrease the anxiety (17).

Having an infant hospitalized at the NICU, for any reason, could be stressful for parents and mostly they would feel confused under the influence of the environment and the technology and they usually feel frustrated, guilty, afraid and concerned about the survival of or the long-term effects of the disease on their infant (12). The results of the study by Miles et al showed that being in an unfamiliar technical environment could be an effective factor in the stress of parents with premature infants (18). But this matter has rarely been discussed in previous studies. So, considering that many infants would require hospitalization in the NICU every year for different reasons and this could cause distress and anxiety for the parents and also changes in their parenting roles, it is necessary to design effective measures for resolving this issue (19). By literature review, it was revealed that NICU orientation program has never been used in any study as a solution for decreasing the anxiety of parents, especially mothers, of premature infants; most of the existing interventional studies are about the effect of cooperative programs on anxiety, and not orientation programs. Therefore, this study was conducted to evaluate the effect of NICU orientation program on decreasing the anxiety of mothers with premature infants.

Methods

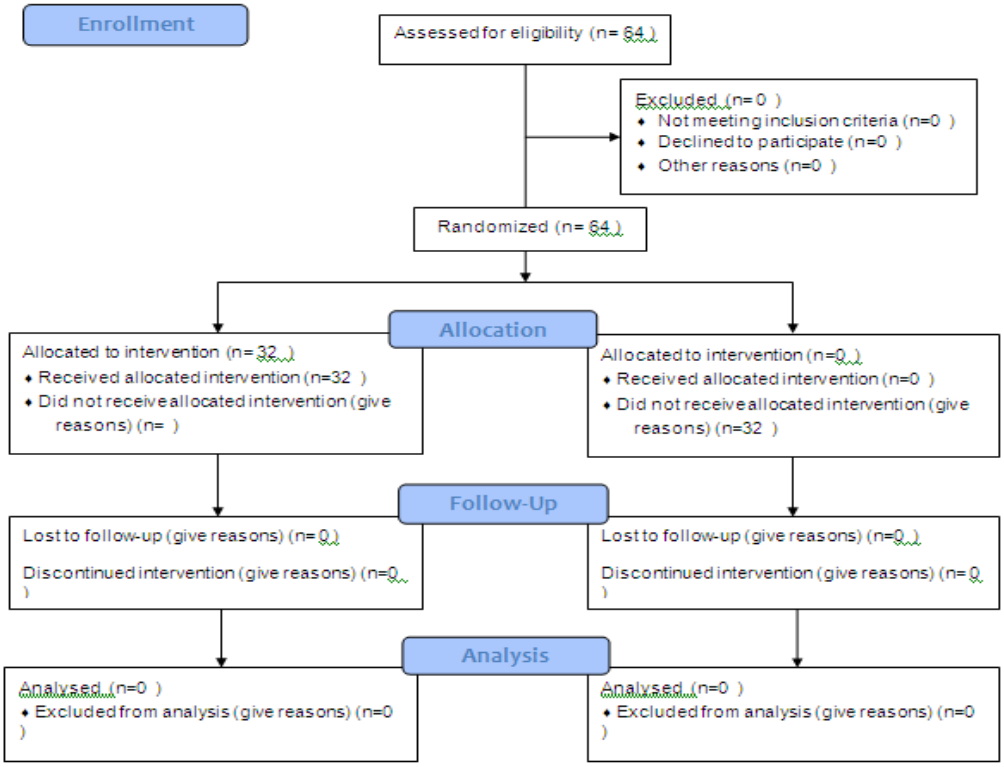
This research was a semi-experimental non-equivalent controlled study that was conducted in 2015. RCT Registration code is IRCT2017011631972N1. Study population included all the mothers of the infants who were hospitalized at the NICUs of Shahrekord. The sample size for this study was calculated based on the study of Karami et al (2009) and assuming $\alpha = 0.05$, $\beta = 90\%$, $\delta 1 = 2.1$ and $\delta 2 = 2.8$, using the following formula:

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\frac{\beta}{2}}\right)^2 (\delta_1^2 + \delta_2^2)}{d^2} = 32$$

The inclusion criteria were being 18 years old or more, being able to read and write, not having a history of preterm delivery or giving birth to anabnormal infant, not having a history of anxiety and depression disorders, gestational age of 23 to 34 weeks at the time of hospitalization, their infant has

been hospitalized for at least one week, not experiencing any severe stressful event during the past 6 months and not having a risky and difficult pregnancy (20). Mothers who their infants were hospitalized over a month were excluded from the study.

To prevent data exchange between the control and the intervention groups, time block method was used. Random sampling was conducted first for the intervention group and then the control group by tossing a coin; meaning that after the sampling of the intervention group was completed, the sampling was paused for three weeks so that the mothers of the intervention group would be discharged. Then sampling for the control group was conducted through the same method (21).



To reach the aim of the study, a two-part questionnaire was used that contained demographic characteristics (9 items about the mother and 6 items about the infant) and the Spielberger's State-Trait Anxiety Inventory. This tool was designed by Spielbergerin 1970 and revised in 1983. The State-Trait Inventory has 40 questions that are score with 4-point Likert scale from 1 (not at all) to 4 (very much). Twenty questions are about situational anxiety which means person's current emotions and twenty are about trait anxiety which means person's background anxiety or predisposition for being anxious. Anxiety status report would be through the mean score. Validity and reliability of this tool have been evaluated by Jafari et al in 2012

where its internal consistency for situational anxiety was 0.93 and for trait anxiety was 0.87 (12). In the present study also the validity and reliability of this tool was evaluated and it had an acceptable validity (0.8-1); its reliability was evaluated by conducting a pilot study on 30 mothers and its Cronbach's α was calculated to be 0.89.

To perform the study, after the hospitalization of the premature infant in the NICU, informed consent was obtained from the mothers and then demographic questionnaire was completed based on the medical files of the infants and the state-trait inventory was competed by interviewing the mothers.

The intervention group received the designed educational program through three 20-minute in-person sessions. Training was presented by an expert (the masters of neonatal intensive care). Theeducational content included introducing the neonatal ward, gaining information about the personnel, the equipment that parents might see at the ward (monitor, respiratory equipment, phototherapy LED, etc.), care conditions (connected intravenous pipes, nasogastric tube feeding, transfusion, etc.), gaining information about the infant's appearance, the emotions that mothers might experience, visiting the ward, participating in the infant's care, breastfeeding and medical terminology. At the end mothers' questions were answered and a designed educational pamphlet was distributed among them. The participants of the control group just received the routine care.

After gathering the data, they were analyzed using SPSS 18. To evaluate the homogeneity of the demographic characteristics of both groups, independent t-test, Mann-Whitney, Chi-square test and Fisher's exact test were used. Also, according to Kolmogorov-Smirnov test, the score of anxiety did not have a normal distribution. So, to compare the difference in pre- and post-intervention scores between both groups, Mann-Whitney test was used. A p value of less than 0.05 was considered significant.

Results

A total of 64 mothers of premature infants were enrolled in the study and since we had no sample loss, data analysis was conducted on 64 samples. No significant statistical difference was observed between both groups regarding their demographic characteristics (Table 1).

The mean scores of parents' anxiety before the intervention in the control and the intervention group were respectively 102.16 ± 4.72 and 100.12 ± 1.66 which had no significant difference ($p > 0.05$). The mean scores of anxiety after the intervention in the control and the intervention group were 101.41 ± 2.71 and 99.81 ± 4.34 respectively. Mann-Whitney test showed no significant difference between the changes in pre- and post-intervention scores of both groups ($p > 0.05$). Also analyzing the subscales of situational and trait anxiety showed that the mean of differences in pre- and post-intervention situational and trait anxiety scores had no significant difference between both groups ($p > 0.05$) (Table 2).

Discussion

The level of anxiety and tension among mothers of premature infants is higher than other mothers and it has negative effects on mother-child relation and infant's developmental outcomes in the future. Results of the present study showed that changes in the pre- and post-intervention scores had no significant difference between both groups and analysis of subscales of situational and trait anxiety also showed that the mean of changes in the pre- and post-intervention scores of situational anxiety had no significant difference between both groups. In this regard, results of previous studies including the study of Valizadeh et al (2016), which has evaluated the effect of orientation program on the anxiety of mothers of infants who are hospitalized in NICU, showed the intervention has decreased the level of anxiety (22).

Table 1. Distribution of central indexes and dispersion of the characteristics of mothers and their premature infant in both groups

Variable			Intervention (N = 32)		Control (N = 32)		Statistical test (p value)
			Mean	SD	Mean	SD	
Infants' demographic characteristics	Birth weight (grams)		1246.25	279.35	1251.25	250.03	T = 0.08 (0.94)
	Apgar score at the first minute		6	1.48	5.59	1.86	Z^* = -0.69 (0.49)
			N	%	N	%	
	Sex	Girl	17	53.1	18	56.3	χ^2 = 0.06 (0.80)
		Boy	15	46.9	14	43.8	
			Mean	SD	Mean	SD	
Age	Mother		28.25	7.56	28.12	6.1	T = -0.07 (0.94)
	Father		30.94	6.86	31.09	5.52	Z^* = -0.96 (0.72)
			N	%	N	%	
Mother's educational level	Illiterate		11	34.4	9	28.1	χ^2 = 0.29 (0.86)
	Diploma		11	34.4	12	37.5	
	Associate degree or higher		10	31.3	11	34.4	
Mother's job	Housewife		23	71.9	21	65.6	Fisher test= 2.09 (0.35)
	Employee		9	28.1	9	28.1	
	Other		0	0	2	6.3	
Father's educational level	Illiterate		8	25	5	15.6	χ^2 = 0.87 (0.65)
	Diploma		15	46.9	17	53.1	
	Associate degree or higher		9	28.1	10	31.3	
Father's job	Unemployed		1	3.1	3	9.4	Fisher test = 1.64 (0.65)
	Laborer		9	28.1	9	28.1	
	Employee		9	28.1	6	18.8	
	Other		13	40.6	14	43.8	
Number of alive children	0		16	50	13	40.6	Fisher test = 2.06 (0.56)
	1		6	18.8	11	34.4	
	2		7	21.8	16	18.8	
	More than 2		3	9.4	2	6.2	
Gestational age	24 to 28 weeks		8	25	8	25	χ^2 = 0.00 (1)
	29 to 32 weeks		12	37.5	12	37.5	
	More than 32 weeks		12	37.5	12	37.5	
History of previous child's death	Yes		5	15.6	3	9.4	Fisher test = 0.71 (0.35)
	No		27	84.4	29	90.6	
Planned pregnancy	Yes		10	31.3	9	28.1	χ^2 = 0.08 (0.78)
	No		22	68.8	23	71.9	
Hospitalization before delivery	Yes		8	25	9	28.1	χ^2 = 0.08 (0.78)
	No		24	75	23	71.9	

Mann-Whitney test*

Table 2. Comparing the mean of differences in the mean score of anxiety, situational anxiety and trait anxiety before and after the intervention in both groups

Variable	Control		Intervention		Mann-Whitney U test P-value
	Mean	SD	Mean	SD	
Anxiety	-0.75	3.71	-0.31	4.24	Z = -0.54 P = 0.59
Situational anxiety	0.56	1.79	-0.22	2.46	Z = -0.91 P = 0.36
Trait anxiety	-1.31	4.37	-0.09	2.69	Z = -0.37 P = 0.71

Results of the study by Ghodrati Torbati et al in 2014 showed that after neonatal care training program, a significant difference was observed between the score of anxiety of the intervention and the control group and the mean score was decreased after the intervention (16). Also, another study has shown that supportive programs like friendly programs for parents and educational session have been effective in decreasing the level of anxiety (23). Another study revealed that educational sessions would decrease the level of anxiety and tension in mothers of premature infants (24). The study of Minaei et al also resulted that after each step of the intervention, the level of anxiety and tension among mothers of the intervention group was lower than the mothers of the control group (25). The study of Chen et al showed that educational-cooperative programs for parents about child care would decrease anxiety (17). Furthermore, some studies have been conducted on the subscales. For example, results of the study by Melnyk et al in 2006 showed that parents' active participation would decrease their situational anxiety by the time of discharge (26). Results of the study by Bastani et al in 2011 revealed that mother's participation in infant care has been effective in decreasing their situational anxiety (13). Another study resulted that in the intervention group the total score of anxiety and scores of situational and trait anxiety was decreased after the intervention, unlike the control group (27). Furthermore, comparing the results of the study by Keshavarz et al in 2011 before and after the intervention in both groups showed a statistically significant difference in the mean score of situational anxiety of mothers in the group of skin contact (28). All of the mentioned studies, despite using different interventional tools and methods, indicated the positive effects of the interventions on decreasing parents' anxiety which is inconsistent with the result of the present study. To explain the results of the present study, it could be said that probably the orientation program could not be effective on decreasing the anxiety of premature infants' mothers by itself. On the other hand, about trait anxiety, it must be noted that this type of anxiety is related to personal differences in tendency toward understanding or evaluating a stressful situation and responding to these situations could be stressful. Also the questions of this subscale are designed in a way to measure general and usual emotions of the individual. Also situational anxiety would express individual's emotions about feeling of tension, fear of the future, unrest, self-blame, impulsiveness, and autonomous system activation (sympathetic and parasympathetic). Situational anxiety could be considered as a section of individual's life or in other words, its occurrence is situational and is specified to stressful situations; therefore it is possible that the present intervention has not been able to affect these dimensions of anxiety. Also the

anxiety of the studied mothers might be affected by other factors which require further studies. Therefore it is recommended to evaluate the effect of various interventions on the anxiety level of mothers of premature infants.

One of the limitations of this study was the small number of samples which was caused by sample loss due to discharge from hospital or transfer to other hospitals to continue their treatment. It is recommended to perform this study with larger sample size and evaluate the effect of this care on mothers' anxiety.

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Conflict of Interest

The authors declare that they have no conflicts of interest

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