

The Effect of training Emotional Support to Fathers on Acute Stress Disorder in Mothers of Preterm Infants Admitted to Neonatal Intensive Care Units

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ABSTRACT

Background & aim: Prematurity and the admission of preterm infants in neonatal intensive care units (NICUs) may pose emotional and practical challenges for parents and can cause acute stress disorder (ASD) in their mothers in case of mismanagement. Emotional support training to fathers may prevent mothers from these symptoms. Therefore, we aimed to investigate the effect of training emotional support to fathers on ASD symptoms in the mothers of preterm newborns admitted to NICUs.

Methods: This clinical trial was conducted on 61 parents, 31 of whom were assigned into the intervention group, with preterm infants admitted in NICUs of Omolbanin Women's Hospital, Imam Reza Hospital, and Ghaem Hospital in Mashhad, Iran, 2016. The parents in intervention group were trained the skills of emotional support in one 120-minute session. Then, they received the educational content in the form of a brochure. The participants in control group received routine care. Prior to the intervention and four weeks after the birth, the mothers in both groups completed the Stanford Acute Stress Reaction Questionnaire (SASRQ) and the emotional support scale (ESS). Data analysis was performed using independent and paired t-tests, as well as Mann-Whitney U, Chi-squared, and Fisher's exact test and two-way analysis of variance in SPSS software, version 16.

Results: The mean scores of SASRQ obtained by the intervention and control groups were 20.7 ± 11.0 and 54.6 ± 24.3 , respectively in post-intervention phase. The results of the independent t-test showed a significant difference between the groups in terms of SASRQ scores ($P < 0.001$).

Conclusion: Given the positive effect of training emotional support to fathers on ASD symptoms in mothers of preterm newborns admitted to NICUs, it is recommended to plan and implement such training courses for fathers during and after birth.

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Introduction

After the publication of the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-4), acute stress

disorder (ASD) was proposed in 1994 to describe abnormal pathological stress reaction occurring within the first 30 days post-trauma

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(1). This disorder is identified by several symptoms such as re-experiencing the traumatic event, recurrent awakenings and nightmares, continuous avoidance of the recurrence of incidents, severe numbness, and increased arousal (2).

This disorder may occur in individuals after experiencing stressful events such as admission of an infant or kid to NICUs or pediatric intensive care units (PICUs), accidents with motor vehicles, traffic injuries, and cancer (10). In the study performed by Vanderbilt et al. in 2009, 24% of mothers of infants admitted to PICU met the screening criteria of ASD in the first post-partum week (2).

As well, the results of the study conducted by Shaw et al. in 2006 showed that 44% of mothers met the ASD criteria during two to four weeks of the hospitalization of their infants in NICUs (3). It was reported that about 80% of trauma survivors, who initially suffer from ASD, experienced post-traumatic stress disorder (PTSD) after six months (4).

Globally, preterm labor (before reaching 37 weeks of pregnancy) is reported approximately in 9.61% of pregnancies (12.9 million individuals) (5). According to the relevant statistics, 10-12% of infants born in less developed countries are premature (6). Iran is among the regions with the high prevalence of preterm labor, with 5000 infants born a day, 12% of which are born prematurely with low birth weight (7).

It should be noted that the birth of newborns usually lead to happiness in family; however, preterm labor causes different obscure emotions in parents. Typically, parents are not mentally, emotionally, and physically prepared for this issue, and they are likely to suffer from acute stress (8). Therefore, a newborn hospitalized in NICU can be considered as an unexpected life event causing damage (9).

Preterm labor challenges the health status of family members in addition to infant's, and then it can endanger the process of transition to parenthood (10). The stress disorder is more observable in mothers in comparison to fathers (11). In the study carried out by Lee et al. in 2008, 77% of mothers had the obvious symptoms of psychiatric trauma even one month later, and 41% of them reported such

problem until 14 months after the preterm labor.

The ASD-related factors included the history of mental problems, high levels of anxiety, mode of delivery, poor communication between mothers and hospital staff, sense of no control over infant, and insufficient support provided by their partners (12). The use of social support, indirect counseling, and psychological debriefing are among the strategies to prevent or moderate postpartum emotional distress (13).

Social support is considered as one of the most important ways of coping with life tensions and facilitating of enduring problems in patients (14, 15). According to the literature, social support refers to the various types support entailing love, companionship, care, respect, attention, and assistance that people receive from others (15). Social support can directly and indirectly affect the mental and physical health status (16).

In addition, social support is comprised of three components of emotional, instrumental, and informational support. Emotional support means the availability of a person to rely on when needed (15). Additionally, this support is provided by the individuals who are interested in, such as spouse, relatives, friends, and contacts with religious institutions (17). This type of support can aid an individual feel comfortable, confident, and affiliated; moreover, it demonstrates the senses of belonging and affection when undergoing tension (15).

In the study performed by Czarnocka et al., insufficient support provided by spouses and hospital staff, as well as the feelings of guilt and low control during labor were reported as the predictors of post-traumatic stress disorder (PTSD). Moreover, previous mental problems and anxiety were considered as the predictors of postpartum anxiety and depression (18). Furthermore, the results of the study conducted by Lindberg and Oehrling in 2008 showed that mothers were not ready for a preterm labor; and they could cope with existing conditions in case of receiving necessary information from health team members and appropriate emotional support from their families (19).

Therefore, maternal and infant health

status requires collaboration of couples, which can be trained to fathers. Face-to-face or spouse-friendly training are the best methods in this regard (20). In addition, teaching with the help of pamphlets is suggested as a complementary method along with face-to-face training technique. Educational pamphlets are considered as a useful and inexpensive educational tool, which can be provided for patients and help individuals to study the contents quickly and review them any time.

Moreover, this method is not accompanied by the fear of asking direct questions from healthcare providers experienced during face-to-face education. In addition, this method can reduce the time spent by healthcare providers. Furthermore, studies have revealed that most information received by patients during face-to-face counseling has not been understood or they have been ignored (21).

The diagnosis of mental health problems in mothers is of paramount importance, and the prevalence of ASD in the mothers of preterm infants admitted to NICUs tends to grow. ASD may lead to PTSD and even depression in case of failure to treat. In addition, the support of fathers to mothers for providing better information and contributing to positive interaction with infant is very important. There is no specific formula for the participation of fathers in care provision systems; therefore, this study was carried out to determine the effect of emotional support training to fathers on ASD symptoms in mothers of preterm infants admitted in NICUs.

Materials and Methods

This clinical trial was conducted among two groups of intervention and control with a pre- and post-test design in 2016. The study population included all mothers, whose preterm infants were admitted to the NICUs of Ghaem, Imam Reza, or Omolbanin Hospitals affiliated to Mashhad University of Medical Sciences, Mashhad, Iran. The samples were selected through convenience sampling method.

The participants, who met the inclusion criteria, were selected and a written informed consent was obtained from all of them. In addition, the minimum sample size was computed using the formula of "comparison

between two independent populations" and based on ASD symptoms. Therefore, a pilot study was performed among 20 women (10 women in each group). The sample size was then estimated as 23 individuals per group (with a 95% confidence interval and power of 80%).

Finally, 33 individuals per group were selected considering the subject attrition; however, two participants in the intervention group were excluded due to stillbirth, and three individuals in the control group were excluded due to stillbirth (two participants) and incomplete follow-up (one subject). Ultimately, this study was performed among 30 and 31 participants in two groups of control and intervention, respectively.

The inclusion criteria entailed willingness to participate in the research, no history of psychotherapy in the last six months, no history of preterm neonatal death, monogamy, single pregnancy, gestational age of 30-35 weeks, and no obvious abnormalities or genetic disorders in infants (such as muscular dystrophy and metabolic disorders). In addition, the exclusion criteria were consisted of infectious disease with a specific disorder (e.g., pathologic jaundice and pneumonia), stillbirth, absence of fathers in the training session, and withdrawal or unwillingness to cooperate in the study at any time.

In this study, data were collected using demographic characteristics form on information about parents and pregnancy, the Stanford Acute Stress Reaction Questionnaire (SASRQ), and the emotional support scale (ESS). The content validity of the demographic characteristics form on information about parents and pregnancy was investigated and confirmed by 10 faculty members of the Faculty of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran.

Additionally, four items of avoidance, dissociation, anxiety, and hyperarousal were assessed using SASRQ. Moreover, 30 items of re-experiencing symptoms were scored based on a 6-point Likert-scale from not experienced (zero) to very often experienced (5 score). In this scale, the 0-10 and equal or higher than 11 scores were indicative of normal and stressful states, respectively. The validity and reliability

of this instrument had been already confirmed in many national and international studies e.g., the study conducted by Willy et al. in 2012 and Moradi's study in 2014 (22). However, the reliability of this questionnaire was calculated by Cronbach's alpha coefficient method equal to 0.87.

In order to sampling and avoiding the spread of the intervention, as well as the distortion of validity of study, the control group was firstly investigated; and after the completion of sampling of the control group, sampling of the intervention group was conducted. Considering the intervention, mothers of preterm newborns, who met the inclusion criteria, completed the SASRQ and they were included in the study if they had obtained the scores of ESS equal to 11 or higher.

The fathers of the preterm newborns were enrolled the study after obtaining an informed consent and meeting the inclusion criteria. Thereafter, they participated in a 120-minute training session that was held in the hospital, where the newborns were admitted during three to seven days after birth. In this session, emotional support was taught to the fathers of premature neonates in the groups of one to three individuals using lecture and question-and-answer methods of teaching.

At the end of the session, an educational pamphlet was given to these fathers. Nevertheless, the control group received the routine care provided in this unit (i.e., fathers could spend an hour in the NICUs and take care of their neonates during this time and meet their spouses). After four weeks post-partum, the SASRQ and the ESS were recompleted by both study groups. The educational content for the intervention group was based on emotional support provided by fathers and the concepts of emotional support derived from the literature.

In this study, the most important ethical considerations included obtaining a special permission from the Ethics Committee of Mashhad University of Medical Sciences, Mashhad, Iran, along with a written informed consent from the participants. After collecting and encoding the data, they were entered into the computer and then analyzed using the SPSS software, version 16, after the accuracy of the

information entry was ensured.

At first, the normality was checked using Kolmogorov-Smirnov and Shapiro-Wilks tests for the quantitative variables of the demographic characteristics of pregnant women and newborns to select an appropriate statistical test. In order to examine the homogeneity of the study groups in terms of intervening and underlying variables, Chi-squared test (for qualitative variables), independent samples t-test (for quantitative variables with normal distribution), and Mann-Whitney U test (for quantitative variables without normal distribution) were applied.

If the expected frequency in more than a quarter of the homes was less than 5, and if the table was two by two, Fisher's exact test was used; nonetheless, exact Chi-squared test was employed if the table was larger than two by two. Moreover, paired t-test was used for an intragroup comparison between the main variables in pre- and post-intervention stages. Furthermore, Chi-squared test was utilized for nominal variables to compare the variables between the groups.

To investigate the relationship between the underlying and intervening variables, as well as the dependent variables, two-way analysis of variance (ANOVA) was used. In this study, the confidence interval and test power were considered to be 95% ($\alpha=5\%$) and 80% ($\beta=20\%$), respectively. In addition, in all the measurements, P-value less than 0.05 was considered statistically significant.

Results

The mean ages of the mothers in the intervention and control groups were 25.0 ± 6.1 and 28.9 ± 6.0 years old, respectively. In addition, the results of the independent t-test suggested a significant difference between the mean age of mothers in both study groups ($P=0.015$). The mean ages of the fathers in the intervention and control groups were about 29.9 ± 5.2 and 33.4 ± 6.4 years old, respectively.

Additionally, there was a significant difference between the mean age of the fathers in both study groups ($P=0.02$). Moreover, the gestational age in the control group was significantly higher than that in the intervention group; therefore, the groups were not

homogeneous in this regard ($P=0.012$). According to the results of two-way ANOVA, these variables did not have a significant effect on the dependent variable ($P>0.05$). Other

demographic characteristics and information about the parents and pregnancy, as well as the homogeneity results in both study groups are presented in Table 1.

Table 1. Frequency distribution of the parents in terms of demographic characteristics and pregnancy in both groups

Variable		Intervention group	Control group	Test results
Mothers' educational stages	Elementary school	4 (12.9)	3 (10.0)	* $P=0.364$
	Junior high school	10 (32.3)	9 (30.0)	
	Senior high school	14 (45.2)	11 (36.7)	
	Higher education	3 (9.7)	7 (23.3)	
Fathers' educational stages	Elementary school	4 (12.9)	5 (17.2)	* $P=0.132$
	Junior high school	9 (29.0)	13 (44.8)	
	Senior high school	13 (41.9)	9 (31.0)	
	Higher education	5 (16.1)	2 (6.9)	
Level of household income	Less than enough	6 (19.4)	9 (30.0)	* $P=0.485$
	Enough	25 (80.6)	20 (66.7)	
	More than enough	0 (0.0)	1 (3.3)	
Marital satisfaction of mothers	Very high	16 (55.2)	20 (66.7)	* $P=0.536$
	High	9 (31.0)	5 (16.7)	
	Moderate	4 (13.8)	4 (13.3)	
	Low	0 (0.0)	1 (3.3)	
Marital satisfaction of fathers	Very high	16 (55.2)	16 (53.3)	* $P=0.643$
	High	10 (34.5)	8 (26.7)	
	Moderate	3 (10.3)	5 (16.7)	
	Low	0 (0.0)	1 (3.3)	
Wanted pregnancy	Yes	29 (93.5)	28 (93.3)	* $P=0.884$
	No	2 (6.5)	2 (6.7)	
Mothers' feeling towards pregnancy	Very happy	15 (48.4)	14 (46.7)	** $P=1.000$
	Happy	13 (41.9)	15 (50.0)	
	Neutral	1 (3.2)	1 (3.3)	
	Unhappy	2 (6.5)	0 (0.0)	
History of hospital admission	Yes	2 (6.5)	5 (16.7)	* $P=0.884$
	No	29 (93.5)	25 (83.3)	
Troubled pregnancy	Yes	8 (25.8)	12 (40.0)	* $P=0.255$
	No	23 (74.2)	18 (60.0)	
Mode of delivery	Natural vaginal delivery with no problems	20 (64.5)	10 (33.3)	*** $P=0.238$
	Natural vaginal with problems	2 (6.5)	1 (3.3)	
	Previous cesarean-section	2 (6.5)	6 (20.0)	
	Emergency cesarean-section	7 (2.6)	13 (43.3)	
Total		31 (100.0)	30 (100.0)	

*Mann-Whitney U test, **Fisher's exact test, ***Chi-squared test

According to the results of the independent t-test at the pre-intervention stage, the mean scores of avoidance ($P=0.103$), anxiety and hyper-arousal ($P=0.109$), re-experiencing ($P=0.432$), dissociation ($P=0.943$), and the total score of ASD symptoms among the mothers ($P=0.345$) were not significantly different in

both intervention and control groups. However, the mean scores of avoidance, anxiety and hyper-arousal, re-experiencing, dissociation, and the total score of ASD symptoms in mothers in the intervention group was significantly lower than those in the control group ($P<0.001$; Table 2).

Table 2. Mean and standard deviation of acute stress disorder symptoms in the mothers of neonates admitted to neonatal intensive care units at pre- and post-intervention phases in both groups

Stage	Intervention group	Control group	Results of independent samples t-test
	Mean±standard deviation	Mean±standard deviation	
Pre-intervention phase	3.72±9.18	8.66±7.25	t=1.0 df=59 P=345.0
Post-intervention phase	7.20±0.11	6.54±3.24	t=7.1 df=40 P<0.001
Difference between pre-/post-intervention phases	-6.51±2.20	2.12±1.19	t=7.9 df=59 P<0.001
Intragroup test (paired t-test)	t=14.2 df=30 P<0.001	t=14.2 df=30 P<0.001	

Moreover, the results of paired t-test demonstrated that the mean scores of ASD symptoms in the intervention group after the intervention were significantly lower than the pre-intervention stage (P<0.001). In the control group, the mean scores of anxiety and hyper-arousal (P=0.032), re-experiencing (P=0.001), dissociation (P=0.001), and the total score of ASD symptoms in the mothers (P=0.002) similarly indicated a statistically significant decrease in the post-intervention stage compared to the pre-intervention phase. However, there was no significant difference between the pre- and post-intervention phases in terms of the mean score of avoidance symptom (P=0.837).

Furthermore, the results of the two-way ANOVA revealed that none of the variables had a significant effect on ASD symptoms (P>0.05).

Discussion

According to the results, the mean scores of ASD symptoms in the intervention group at the pre-intervention phase was significantly lower than those obtained in the control group. Consistent with our results, Abdeyazdan et al. in 2014 revealed that providing early emotional support training to the parents of preterm neonates could reduce their stress level, and these interventions were likely to empower parents to take care of newborns and assume parenting roles (23).

One of the reasons for such an agreement was providing emotional support to families at

early stages in the first week of the birth of a premature newborn in a two-hour session in both studies. Furthermore, the findings of the study conducted by Karami et al. in 2009 demonstrated that the implementation of educational-supportive interventions could significantly moderate stress in mothers of preterm newborns (24). The results of the mentioned study were in line with the findings of the present investigation.

It is worth mentioning that support from parents could be cited in both studies as reasons for such a consistency. In the study performed by Karami et al., educational-supportive interventions were implemented in the form of videos and booklets in order to prepare mothers for coping with the stress of preterm labor. In the present study, the fathers were taught about emotional support. Given the crucial role of fathers in supporting families and mothers, especially in critical situations, this type of training could make fathers more familiar with their roles and responsibilities.

Accordingly, this type of intervention was considered as a family-centered method (25). It can be expected that stress levels and ASD symptoms in mothers will be reduced, because it is assumed that social support can act as a stress reliever in the face of stress (26). Inconsistent with the results of the present study, Ahmadi et al. in 2003 examined the effect of social support by husbands on postpartum depression among their spouses and found no

significant difference between the levels of depression in two study groups (27). This inconsistency might be due to different methods of implementing interventions and educational support, as well as the time of the studies.

Spousal social support was taught in the study by Ahmadi through tapes and educational pamphlets, while at least one face-to-face session was required with questions and answers to reduce ambiguities. Considering the expansion of mass media and social networks, as well as raising the awareness of individuals about the rights and duties towards each other in comparison with the past, it was expected to obtain different results. Another reason for the given discrepancy was the dependent variable evaluated, which was depression in the study by Ahmadi, while we investigated ASD symptoms in the present study.

Assuming stress as an underlying factor for the incidence of depression, changes in the levels of depression could not be easily attained. The levels of depression in the intervention group before the intervention were lower than those at the pre-intervention stage in the Ahmadi's study (27). The mean post-intervention scores of ASD were significantly lower than those at the pre-intervention phase. Since teaching spousal emotional support serves as a protective measure taken to support mothers against stress, it can have beneficial effects on their physical and mental health status and also help them adapt better and faster to stressful situations (26, 28). Moreover, after the intervention, the mean score of the ASD symptoms in the control group was significantly lower than that in the pre-intervention stage. One of the reasons for the reduction of the ASD symptoms among mothers in the control group was the passage of time. It should be noted that most individuals can return to their relatively normal conditions in spite of having ASD symptoms (26).

One of the limitations of this study was the lack of ability to exactly control the participants in terms of obtaining information and knowledge from other sources. One of the other limitations of this study was inter-individual

differences and the mental and psychological status of the parents, which could have their own effects on ASD symptoms.

Conclusion

Given the positive effect of teaching emotional support on reducing the ASD symptoms, holding training sessions during birth or post-partum for fathers in order to support the mothers of preterm newborns can lower ASD symptoms. Therefore, support provided by husbands to their spouses in stressful conditions can act as a protective factor and improve their mental and physical health status. In addition, continuous programs are suggested for the presence of fathers in training classes during birth, especially in the time of preterm labor. Considering the positive effect of emotional support by husbands, it is recommended to the relevant authorities to pay much more attention to the presence of fathers in such educational courses.

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Conflicts of interest

Authors declared no conflicts of interest.

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