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The Effect of Educational-supportive Interventions on Distress Tolerance of Parents of Premature Infants in Neonatal Intensive Care Unit

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ABSTRACT

Background: Parents of premature infants are more likely to be exposed to stressful situations than parents of term infants. This study aimed to determine the effect of educational-supportive interventions on the tolerance of parents of premature infants admitted to the neonatal intensive care unit (NICU).

Methods: In this quasi-experimental study, the participants included 50 parents of premature infants admitted to one of the NICUs in Shiraz, Iran from October 2019 to May 2020. Parents were randomly assigned to intervention and control groups. Educational intervention (training package and its content) was done in five 45-minute sessions for two weeks and three times a week. The supportive care was provided one day after the intervention. The data were collected using a demographic questionnaire and Distress Tolerance Scale and analyzed by SPSS 24 using paired t-test, independent t-test, and chi-square test.

Results: The mean scores of the mothers' and fathers' distress tolerance in the pre-intervention stage were 36.0 ± 6.1 , 33.9 ± 7.4 in the control group ($P < 0.14$), and 38.4 ± 5.8 , 38.0 ± 5.9 in the experimental group ($P < 0.001$), respectively. After the intervention, the mean scores of the mothers' and fathers' distress tolerance in the control group were 35.9 ± 5.3 and 36.5 ± 6.3 , and in the experimental group 54.7 ± 5.3 , 53.0 ± 6.0 , which compared to before the intervention showed a significant increase ($P < 0.001$).

Conclusion: Supportive-educational programs can increase distress tolerance in parents of premature infants. In the future, these programs can be planned to promote the quality of infant care.

Introduction

According to the definition of the World Health Organization, infants born at the age of 20-37 weeks from the first day of the last menstrual period are considered premature.¹ Preterm birth is a worldwide epidemic with a global incidence of 15 million/year, and nearly 1 in 10 babies is stillborn preterm.² The prevalence rates of preterm delivery in different cities of Iran were reported between 5.6% to 39.4%.³

Most premature babies have several problems at the time of birth requiring special care.⁴ Stress from premature birth is intensified with prolonged hospitalization of the premature infant.⁵ About 77% of mothers show clear signs of psychological trauma even up to one month later and 49% show the symptoms up to one year after the birth of a premature baby, affecting a person's quality of life if such symptoms become chronic. Approximately 28 to 70 percent of mothers of premature infants suffer from a high level of stress.⁶ Research showed that mothers who are separated from their babies had a high level of anxiety and depression and demonstrated numerous psychological reactions.⁷⁻⁹ Mal-adaptive responses to stress reduce the level of distress tolerance in the mother.¹⁰ Interventional program focusing on relieving mothers' anxiety and stress is needed to prevent maternal stress and anxiety at an early stage.¹¹

Families with premature infants need education and supportive interventions to increase the level of distress tolerance and improve parents' well-being. Fathers also need emotional support. Education will have highly positive effects on parental adjustment. Supporting the family and giving information to them are necessary to control their situation, gain a more realistic view of their baby, and participate in their baby's care.^{9,12-13}

The informational-emotional support program can reduce stress levels in fathers of premature infants admitted to NICU.¹⁴ In this regard, Prouhet et al. stated that by

recognizing the amount and type of psychological stress in fathers, nurses can have more support for fathers in their new role, and young fathers and those with very premature infants may need support and additional resources.¹⁵ Supportive intervention according to individual needs reduces anxiety and stress of parents.¹⁶

Mothers of infants admitted to the NICU are emotionally vulnerable. Identifying and treating their emotional disorders in the form of depression and stress is a fundamental part of nursing care as it increases mothers' ability to interact with the nursing team and ultimately with the baby.¹⁷ Therefore, to cope with problems, interventions should be done for reducing parental stress with the goal of improving the emotional health of parents.¹⁸

Considering that there are few studies in Iran on supporting parents with premature infants to cope with distress and there is an urgent need to care for families with premature infants, it is necessary to develop a supportive-educational program. In this regard, nurses have a unique opportunity to help parents. Other studies were done on one parent, especially the mother but this study was conducted on both parents to facilitate the relationship between them and increase the quality of infant care.

This study aimed to determine the effect of educational-supportive interventions on the distress tolerance of parents of premature infants in the NICU.

Materials and Methods

This quasi-experimental study was done from October 2019 to May 2020. The study incorporated availability sampling method. The sample included parents of premature infants hospitalized in one of the NICUs of the Hazrat Zeinab Hospital (as it has five NICUs) in Shiraz, Iran. The sample size was calculated for each group as 25 mothers and 25 fathers) at 95% confidence level and statistical power of 90% using the following equation.¹⁹

For the purpose of study, the researcher referred to the NICU daily and if the parents were eligible, they were included in our study. Then, parents were randomly assigned to intervention and control groups. The cards with the words C and M written on them were prepared and each participant was asked to choose a card at random. Then parents with a card with the letter C were placed into the control group and parents with a card with the letter M were placed in the intervention group.

The inclusion criteria are as follows, the willingness to participate in the study, ability to care for the baby, having literacy, having Iranian nationality, being fluent in Persian, availability of both parents, and fetal age of the baby being 30-36 weeks as infant mortality is significantly higher in infants born before 30 weeks of gestation, the baby's hospitalization for at least 14 days in the ward, the parents' non-attendance in educational-supportive courses related to the premature infant, and the parents' non-use of psychiatric drugs. Having an infant with another disorder that could be diagnosed and cause maternal stress and frustration, the participants who were absent at two sessions of the training course and those who had a history of premature birth or hospitalization in the NICU were excluded from the study. The absolute exclusion criteria includes infant death and parent death.

The instruments were a demographic questionnaire and Distress Tolerance Scale (DTS). It was built by Simons and Gaher in 2005 and has 15 items and four subscales called tolerance (3 items from 3-15 score), absorption (3 items from 3-15 score), regulation (3 items from 3-15 score) and appraisal (6 items from 6-30 score). Items were rated on a 5-point scale: (5) strongly disagree, (4) mildly disagree (3) agree and disagree equally, (2) mildly agree, (1) strongly agree. High scores represent high distress tolerance. The minimum score is 15 and the maximum is 75. Test-retest reliability was good (ICC $r = .61$).²⁰ The reliability of the scale was assessed by Azizi and co-workers (2010).²¹

After the admission of the premature

infant, the questionnaires were given to the parents. To prevent parental stress, each parent separately completed the questionnaires (mothers in the restroom next to the ward and fathers in the conference room). The control group did not receive any intervention except for routine ward care, breastfeeding training, and kangaroo care. The intervention was conducted in two educational and supportive stages. In the educational stage, five 45-minute training sessions 3 times a week were held face to face, both individually and in the groups. The same training sessions were held through WhatsApp groups due to a lack of full presence and availability to parents. The training sessions included an introductory session, a baby care session, two sessions on stress reduction and tolerance, and a question and answer session by the researcher and a psychologist using PowerPoint, Voice messages, and WhatsApp groups. At the end of the sessions, the parents were given an educational booklet. Besides, one day after the training stage, the support stage was implemented in the presence of the parents. To exchange their ideas and share information, the parents attended a room next to the ward for three days in five groups at the appointed time upon prior arrangements made with the manager and the head of the ward and talked for half an hour. Then, they spent half an hour together by the baby's bed, watching and caring for the baby. One month after the end of the supportive stage in the clinic, when the parents came to visit the pediatrician, the distress tolerance scale was completed again by the participants in both groups. The questionnaire was distributed by the researcher.

Our education was based on a comprehensive approach in the domain of family education that evaluates seven domains including communication, problem-solving, emotional responses, roles, emotional involvement, general function, and behavioral control. This can be used to help couples who have problems and families with a physically

disabled member.^{22,23}

To comply with ethical principles, the participants in the control group were given an educational package. Finally, the collected data were encoded and analyzed by SPSS 24 using paired t-test, independent t-test, and chi-square test at the significance level of 0.05.

The research proposal was approved by the Ethics Committee of Yazd Shahid Sadoughi University of Medical Sciences (IR.SSU.REC.1398.207). The research goals, the anonymity of the information provided, and voluntary participation were first explained and the participants then read and signed the written informed consent form; then, they completed the questionnaires.

Results

The mean age of mothers in the control and intervention groups was 27.0 ± 4.0 and 28.7 ± 3.9 , respectively, and the mean age of fathers was 28.6 ± 4.2 and 29.01 ± 4.1 years, respectively (independent t-test, fathers, $P = 0.13$ and mothers, $P = 0.86$). The mean weight of neonates in the intervention group was 1887.0 ± 434 and in the control group was 1990.0 ± 419 ($P = 0.39$). The mean age of neonates in the intervention group was 33.8 ± 1.78 and in the control group was 32.1 ± 1.8 ($P = 0.17$). The two groups were compared in terms of demographic variables of age, level of education, occupation, etc. before the intervention and there was no

significant difference (Table 1).

The results of the independent sample t-test indicated that there was no statistically significant difference between the experimental and control groups before the intervention in terms of parental distress tolerance ($P > 0.05$). However, after the intervention, the mean score of distress tolerance was significantly higher among the intervention group than in the control group ($P < 0.001$). Besides, the parental distress tolerance score in the experimental group showed a significant increase after the intervention ($P < 0.001$). The mean scores of the mothers' and fathers' distress tolerance in the pre-intervention stage were 36.0 ± 6.1 , 33.9 ± 7.4 in the control group and 38.4 ± 5.8 , 38.0 ± 5.9 in the experimental group, respectively. After the intervention, the mean scores of the mothers' and fathers' distress tolerance in the control group were 35.9 ± 5.3 , 36.5 ± 6.3 , and in the experimental group 54.7 ± 5.3 , 53.0 ± 6.0 , which compared to before the intervention had a significant increase ($P < 0.001$) (Table 2).

The mean scores on all subscales of parental distress tolerance before and after the intervention were not significantly different for the control group (Table 3).

Discussion

This study showed that supportive-educational programs can increase the distress tolerance of parents of premature neonates.

Table 1. Demographic Characteristics of Parents in Two Study Groups

Variable			Intervention group	Control group	P-value*
			(n = 25) N(%)	(n = 25) N(%)	
Occupation	Mother	Employee	5(20)	1(4)	0.08
		Housewife	20(80)	24(96)	
	Father	Employee	23(92)	21(84)	< 0.001
		Other	2(8)	4(16)	
Education	Mother	Diploma	11(44)	12(48)	0.11
		University	14(56)	13(52)	
	Father	Diploma	12(48)	12(48)	
		University	13(52)	13(52)	
Neonatal Gender	Girl	13(52)	14(56)	0.16	
	Boy	12(48)	11(44)		

* Chi-square test

Table 2. Comparison of the Mean Scores of Parental Distress Tolerance in the Control and Intervention Groups Before and After the Intervention

Group		Distress tolerance		P-value*
		Before Intervention	After Intervention	
		Mean \pm SD	Mean \pm SD	
Mothers	Control	36.1 \pm 6.1	35.9 \pm 5.3	0.94
	Intervention	38.4 \pm 5.8	54.7 \pm 5.3	< 0.001
	P-Value**	0.15	< 0.001	
Fathers	Control	33.9 \pm 7.4	36.5 \pm 6.3	0.14
	Intervention	38.0 \pm 5.9	53.0 \pm 6.0	< 0.001
	P-Value**	0.24	< 0.001	

* Paired t test; ** Independent t test

Reyhani et al. stated that self-care education reduces psychological stress and increases the tolerance of mothers with premature infants in the NICU²⁴ which is consistent with the results of the present study. After educational intervention in both studies, a significant increase was observed in each of the dimensions of distress tolerance. The significance of the dimensions indicates the mother's efforts to reduce her distress. Regarding the effect of education and support on reducing parental distress, the mean scores of the dimensions of distress tolerance before and after the intervention showed an increase in all its dimensions (tolerance, absorption, appraisal, and regulation) after the intervention. The difference between these two studies was in the type of educational intervention which in the present study was

supportive and one month after the intervention all dimensions of distress tolerance became significant, but in the study by Reyhani et al, except for dimension of regulation, none of the subscales of distress tolerance scale in the follow-up phase were significant.²⁴

In the study of Lotfi Kashani et al. child care education reduced maternal stress, the results of which were consistent with the present study. Both studies showed that support and care have a positive effect on reducing mothers' stress, which has increased their hope and value in life, as well as gives them a sense of balance in life, and teaches mothers how to cope with their child's illness.²⁵

In fact, giving education creates a feeling of control and power on the part of the parents over their situation and encourages them to participate more in caring for the baby.

Table 3. Comparison of the Mean Score of Parental Distress Tolerance Subscales Before and After Intervention in Control and Intervention Groups

Group		Time	Subscales			
			Tolerance	Absorption	Appraisal	Regulation
			Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Mothers	Control	Before	7.4 \pm 1.3	7.1 \pm 1.3	14.2 \pm 2.6	7.4 \pm 1.3
		After	7.2 \pm 1.2	7.2 \pm 1.2	14.5 \pm 1.9	7.2 \pm 1.2
		P-value*	0.69	0.83	0.66	0.69
	Intervention	Before	7.8 \pm 1.2	7.6 \pm 1.4	15.3 \pm 2.2	7.8 \pm 1.2
		After	11.0 \pm 1.3	11.0 \pm 1.1	21.8 \pm 2.5	11.0 \pm 1.3
		P-value*	< 0.001	< 0.001	< 0.001	< 0.001
Fathers	Control	Before	6.7 \pm 1.6	6.9 \pm 1.6	13.6 \pm 3.2	6.7 \pm 1.6
		After	7.1 \pm 1.2	7.4 \pm 1.4	14.5 \pm 2.9	7.1 \pm 1.2
		P-value*	0.27	0.14	0.21	0.27
	Intervention	Before	7.6 \pm 1.3	7.6 \pm 1.2	15.3 \pm 2.5	7.6 \pm 1.3
		After	10.6 \pm 1.5	10.7 \pm 1.4	21.0 \pm 2.3	10.6 \pm 1.5
		P-value*	< 0.001	< 0.001	< 0.001	< 0.001

* Paired t-test

In a study by Karami et al., the results showed that the implementation of an educational-supportive intervention program significantly reduced the stress of parents, but was not effective during hospitalization due to the short duration of the study.¹⁹ Which is consistent with the present study, but the difference between the two studies was that the present study did not examine the length of hospital stay. Sometimes, mothers of disabled infants and children use such maladaptive strategies and emotional schemas to manage emotions, which can put them at risk of conflicts.²⁶

All the studies support the results of the present study, even though different intervention tools and methods have been used. Explaining the effectiveness of the educational-supportive program in increasing the tolerance of distress of parents participating in this study, it can be said that educational interventions make parents better aware of how to care for their baby and recognize their strengths and weaknesses and correct and try to strengthen them. Creating awareness of abilities helps parents to deal with problems more efficiently and appropriately, and increase their distress tolerance. The strengths of this study were building confidence, security, emotional stability, learning readiness, and social development of parents. One limitation of this study was the deployment of available sampling method. Also, if this study was conducted during a longer time span, the results could be more generalizable.

Conclusion

Supportive-educational programs can increase distress tolerance of parents of premature infants, facilitate the relationship between them, and can increase the quality of infant care. Therefore, it is suggested that healthcare workers arrange such educational and supportive programs for parents in NICU.

Conflict of Interests

Authors have no conflict of interests.

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References

1. Thanh NX, Toye J, Savu A, Kumar M, Kaul P. Health service use and costs associated with low birth weight: a population level analysis. *J Pediatr* 2015; 167(3): 551-6.
2. Purisch SE, Gyamfi-Bannerman C. Epidemiology of preterm birth. *Semin Perinatol* 2017; 41(7): 387-91.
3. Dolatian M, Mirabzadeh A, Forouzan AS, Sajjadi H, Alavi Majd H, Moafi F. Preterm delivery and psycho-social determinants of health based on World Health Organization model in Iran: a narrative review. *Global J Health Sci* 2013; 5(1): 52-64.
4. Lawn JE, Kinney MV, Belizan JM, Mason EM, McDougall L, Larson J, et al. Born too soon: accelerating actions for prevention and care of 15 million newborns born too soon. *Reprod Health* 2013; 10(Suppl 1): S6-10.
5. Arnold L, Sawyer A, Rabe H, Abbott J, Gyte G, Duley L, et al. Parents' first moments with their very preterm babies: a qualitative study. *BMJ Open* 2013; 3(4): e002487.
6. Gray PH, Edwards DM, O'Callaghan MJ, Cuskelly M, Gibbons K. Parenting stress in mothers of very preterm infants--influence of development, temperament and maternal depression. *Early Hum Dev* 2013; 89(9): 625-9.
7. Karbandi S, Hosseini SM, Masoudi R, Mamori GA. The effect of relaxation training on

- breastfeeding self-efficacy of mothers with preterm infants: A randomized clinical trial. *J Clin Nurs Midwifery* 2014; 3(2):37-45. [In Persian].
8. Ong SL, Abdullah KL, Danaee M, Soh KL, Soh KG, Japar S. Stress and anxiety among mothers of premature infants in a Malaysian neonatal intensive care unit. *J Reprod Infant Psychol* 2019; 37(2): 193-205.
 9. Kawafha MM. Parental stress in the neonate intensive care unit and its association with parental and infant characteristics. *J Neonatal Nurs* 2018; 24(5): 266-72.
 10. Valizadeh L, Hosseini MB, Heydarpoor Damanabad Z, Rahkar Farshi M, Asgari Jafarabadi M, Ranjbar Kochaksaraie F. Effect of NICU department orientation program on mother's anxiety: A randomized clinical trial. *J Caring Sci* 2016; 5(3): 205-14.
 11. Rutherford HJV, Goldberg B, Luyten P, Bridgett DJ, Mayes LC. Parental reflective functioning is associated with tolerance of infant distress but not general distress: Evidence for a specific relationship using a simulated baby paradigm. *Infant Behav Dev* 2013; 36(4): 635-41.
 12. Mansourian M, Ziapour A, Kazemian M, Heydarpoor Damanabad Z, Rastegarimehr B, Mirzaei A, et al. Assessment of educational performance of nurses in neonatal intensive care unit from parents' perspective. *J Educ Health Promot* 2020; 9: 8.
 13. Askari M, Noah SBM, Hassan SAB, Baba MB. Comparison the effects of communication and conflict resolution skills training on marital satisfaction. *Int J Psychol Stud* 2012; 4(1): 182-95.
 14. Shahkolahi Z, Abdeyazdan Z, Mehrabi T, Hajiheidari M. Supporting fathers of premature infants hospitalized in Neonatal Intensive Care Unit (NICU). *Iran J Crit Care Nurs* 2014; 7(1): 31-40.
 15. Prouhet PM, Gregory MR, Russell CL, Yaeger LH. Fathers' stress in the neonatal intensive care unit: A systematic review. *Adv Neonatal Care* 2018; 18(2): 105-20.
 16. Giménez EC, Sánchez-Luna M. Providing parents with individualized support in a neonatal intensive care unit reduced stress, anxiety and depression. *Acta Paediatr* 2015; 104(7): e300-5.
 17. Segre LS, Chuffo-Siewert R, Brock RL, O'Hara MW. Emotional distress in mothers of preterm hospitalized infants: a feasibility trial of nurse-delivered treatment. *J Perinatol* 2013; 33(12): 924-8.
 18. Ghorbani M, Dolatian M, Shams J, Alavi-Majd H. Anxiety, post-traumatic stress disorder and social supports among parents of premature and full-term infants. *Iran Red Crescent Med J* 2014; 6(3): e13461.
 19. Karami K, Rostami S, Ghadirian F. Effect of educational-supportive interventions on premature infants' length of hospitalization and maternal stress. *Yafte* 2009; 11(2): 67-73. [In Persian].
 20. Simons JS, Gaher RM. The distress tolerance scale: Development and validation of a self-report measure. *Motiv Emot* 2005; 29(2): 83-102.
 21. Azizi AR, Mirzaei A, Shams J. Correlation between distress tolerance and emotional regulation with students smoking dependence. *Hakim Res J* 2010; 13(1): 11-8. [In Persian].
 22. Pourmovahed Z, Zareei Mahmoodabadi H, Yassini Ardekani SM, Fallahzadeh H, Tavangar H, Mazloomi Mahmoodabad SS. Validation of the family stability questionnaire in married couples: a confirmatory factor analysis. *Electronic Physician* 2018; 10(8): 7185-95.
 23. Zareei H, Bahrami F, Ahmadi A, Etemadi O, Sadat M, Fathizadeh M. The effectiveness of retraining attribution styles (cognitive therapy) on dimensions of family functioning in divorce applicant couples. *Int J Psychol Stud* 2012; 4(2): 257-63.
 24. Reyhani T, Sekhavat Pour Z, Heidarzadeh M, Mousavi SM, Mazloom SR. Investigating the effects of spiritual self-care training on psychological stress of mothers with preterm infants admitted in NICU. *Iran J Obstet Gynecol Infertil* 2014; 17(97): 18-27. [In Persian].
 25. Lotfi Kashani F, Vaziri SH, Arjmand S, Misavi SM, Hashemiyeh M. Effectiveness of spiritual interventions to reduce maternal distress in children with cancer. *J Med Ethics* 2012; 6(20): 173-86. [In Persian].
 26. Ebrahimi ME, Zamani N, Ansari Shahidi M. Relationship between distress tolerance, helplessness and fundamental recognition in the schemes of mothers of children with mental disorders and mothers of children with physical disabilities. *MEJDS*. 2018; 8: 19. [In Persian].