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The Effect of Telephone Health Training on Perceived Stress of Mothers with Premature Infants Discharged from Hospital

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ABSTRACT

Background: Premature birth is a global health issue leading to major stress in mothers who will be able to get answers to many of their questions at home through a phone call. This study aimed to investigate the effect of telephone health training on the perceived stress of mothers with premature infants discharged from the hospital.

Methods: This quasi-experimental study was conducted on 60 mothers referring to Shohada-ye Kargar Hospital (Yazd, Iran) in 2022. They were selected using a purposive sampling method and then randomly assigned to the control and intervention groups. Data collection was accomplished with the Perceived Stress Questionnaire and demographic questionnaire. Telephone training was performed in the intervention group. The control group received ordinary care at discharge time. Data were analyzed with SPSS22 using paired t-test, independent t-test, and chi-square test.

Results: The mean perceived stress of mothers was 25.10 ± 2.32 and 25.33 ± 3.12, in the intervention and control group before the intervention, respectively. These scores were 21.24 ± 1.83 and 24.14 ± 2.81, respectively after the intervention, and they decreased significantly in the intervention group (P = 0.03).

Conclusion: Telephone health training is regarded as an efficient and low-cost method for reducing the perceived stress of mothers with premature infants discharged from the Neonatal Intensive Care Unit. Improving maternal and neonatal health is suggested.

Keywords: Telephone training, discharge, perceived Stress, mothers, neonatal intensive care unit.

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Introduction

Without any guidelines or reliance on cultural and social factors, becoming a mother is a dynamic, learnable, and stressful process (Zareinejad, et al, 2018). The postpartum period is considered as a critical stage influencing the physical and mental health of mothers (Daglar, et al, 2018). The experience of motherhood can occasionally be accompanied by numerous difficulties caused by taking care of the neonate (Javadifar, et al, 2016). Mothers with premature neonates admitted to the Neonatal Intensive Care Unit (NICU)indicate more signs of stress concerning their child's health (Maghare Abed, et al, 2024). The traumatic effect of the premature birth of a neonate on the mother disrupts her ability to think (Cunningham, et al, 2014). Premature neonate refers to the one born before the 37th week of gestation based on the date of the first day of the mother's menstrual cycle (El-Hage, et al, 2012). In Iran, the prevalence of premature birth varies in different cities and it is reported to vary from 5.6 to 13.4% (Chehreh, et al, 2018). Premature neonates have more physical, mental, and psychological difficulties compared to normal neonates (Tellapragada, et al, 2016). The birth of a premature neonate as an emotional crisis can cause a stressful situation in their lives leaving a long-term impact on them (Watson, 2011). In this regard, perceived stress is the main factor affecting the correct performance and responsibility of mothers (Leung, et al, 2010). It includes a reduction in the mother's confidence in her ability to meet her child's requirements satisfactorily and effectively (Partovi, et al, 2019). Perceived stress is rendered an important prerequisite for behavior change, which establishes a connection between awareness and action and can play a moderating role in empowering individuals (Abdi & Kaboodi, 2016). The condition of the premature neonate challenges the mother's perceived stress more than ever, making her self-judgments tinged with feelings of guilt and inefficiency (Behroozi, et al, 2013). Neglecting the emotional and psychological stress of the mother increases the vulnerability of the neonate and the mother (Abedi, et al, 2017). In this regard, the results of the study by Ionio et al. suggested that mothers are more stressed than fathers immediately after the birth of a premature neonate (Ionio, et al, 2016). Due to the length of the treatment process, there is a need to establish a continuous and dynamic care relationship between the health team and the mothers to improve the quality of life of the mother and neonate and their health (Basharpoor, et al, 2015). Mothers of premature neonates often cannot participate in face-to-face training classes after discharge due to the condition of the neonate. Therefore, health training by phone is emphasized. Telephonic training reduces the cost and time of access to care and leads to the improvement of the relationship between patients and care providers (Maleki, et al, 2022). By using communication resources, telephone calls cause the development of educational care, counseling care, therapeutic care, self-management, quality of care as well as quality of life at home. Telephone training by maintaining continuous communication and active participation among health care providers, patients, and families as a crucial part of care services leads to modifying incorrect health behaviors, reducing the rate of re-hospitalization and hospital visits, saving money and time, and satisfying vulnerable patients. Post-discharge training by telephone is an easy and cost-effective method compared to face-to-face training (Hasan Zadeh LifShagard, et al, 2013). Telephones exist in many patients' homes and can be used in substantial aspects of health care such as education, emotional support, and information communication (Lee, 2003). Families can get answers to many questions they have at home through a phone call(de Klerk, et al, 2005). Nowadays, to reduce family visits and their unnecessary crowding behind the closed doors of the NICUs, a huge amount of information can be transferred to them in a short time using communication technology such as the telephone.

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In this way, a solution was found to solve the problem of information communication and as a result to deal with their stress. Non-face-to-face communication has created opportunities for care to be removed from the monopoly of clinics and hospitals and transferred to the daily residential place of patients at home. Considering the problems in the care of premature neonates and the stress of mothers and its destructive effects, as well as the lack of proper care of premature neonates after discharge, there is a possibility of serious problems in this regard. Consequently, the present researchers embarked on conducting this study to explore the effect of telephone health training on the perceived stress of mothers with premature neonates after discharge from the hospital to improve the health of mothers and neonates.

Methods

This quasi-experimental study with a before-after design and a control group was conducted in Shohada-ye Kargar Hospital, Yazd. The samples were selected using the targeted sampling method. For this purpose, 60 mothers with premature newborns were selected based on the inclusion and exclusion criteria of the study in 2022. Then, using random allocation software, they were assigned to two intervention and control groups. The inclusion criteria were: the neonate with a fetal age of 30-36 weeks, the neonate being physiologically stable, the absence of any congenital anomalies, the mother being Iranian and literate, having access to a landline or mobile phone, and willingness to participate in the study. Exclusion criteria were: unavailability of mothers after discharge, having a history of giving birth to a premature neonate and taking care of him in a NICU or at home, and unwillingness to continue cooperation. The sample size was estimated to be 27 mothers in each group via studying the guidelines and using the formula for calculating the means. Considering possible subject attrition (10%) and according to a similar study, 30 individuals were studied in each group (Latifnejad, et al, 2011). The significance level of 0.05 and the power of the test of 0.80 were considered.

$$n = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2}$$

$$n = \frac{(3.96 + 3.64)^2 (5.15 + 5.48)}{(4.77)^2}$$

The demographic information questionnaire and Cohen's perceived stress questionnaire were applied to glean the required data. This questionnaire was prepared by Cohen et al. (1983) and entails 14 items. It is used to measure perceived general stress in the past month and measures controlling, overcoming, and coping with mental pressure and experienced stress through examining responses, thoughts, and feelings about stressful events. This questionnaire has been translated into various languages and standardized in many countries. Each item is scored on a 5-point Likert scale as follows: never = 0, almost never = 1, sometimes = 2, often = 3, and most of the time = 4. Items 4 to 7, 9, 10, and 13 are scored inversely and the maximum score is 56. A higher score indicates greater stress. Cronbach's α was 0.85 for the whole questionnaire (Cohen, et al, 1983; Asghari, et al, 2013). After approval of the study proposal and obtaining permission from the Committee of Ethics in Human Research at the university, the researcher introduced herself to the neonate's parents and provided essential explanations about the objectives of the research. Additionally, the researcher ensured the participants the confidentiality and anonymity of the mothers' information obtained written consent, and took two hand-line and cell phone numbers from them. During the intervention, the researcher communicated with only one specific number in all the calls which was already known to the family. Post-discharge intervention was performed through telephone calls on the first, third, fifth, seventh, and tenth days after discharge. Moreover, mothers were reminded that

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they could call at any time during the day if needed. At the beginning of each phone conversation, the parties reviewed a portion of the previous call together to ensure both an accurate understanding of the previous conversations and the nature of the real person on the phone. Each phone conversation took 15 to 30 min. The educational content of the conversations was considered based on the latest protocols of the Ministry of Health, similar studies, and consultation with the neonatologist, and the nurse in charge of the NICUs. There was no other intervention for the control group besides routine medical care. The control and intervention groups 'questionnaires were refilled via telephone calls on the fourteenth day following discharge. Data were analyzed with SPSS22 using independent t-test, paired t-test, and chi-square (X^2).

Results

The content of the telephone conversations with the mothers of the intervention group is displayed in Table 1.

Table 1. The content of the telephone conversation with the mothers of the intervention group

Session	Content
1	Breastfeeding training, ways to increase breast milk and store it, breast care, hand washing and personal hygiene in neonate care and milking, and skin-to-skin contact between mother and neonate.
2	Examining the condition of vital signs of the neonate and jaundice, respiratory condition, urination, and defecation pattern, bathing, and administering medicine.
3	Early signs of the neonate's sickness, the neonate's consciousness level, encouraging the mother to express her feelings, needs, and desires, discussing the condition of the premature neonate, and the ways of care-taking at home.
4	Colic pains, infant massage, reflux and prevention of vomiting, infant sleep patterns, the time needed to visit a specialist for examination and re-examination, and neonatal screenings.
5	Strengthening the self-confidence of mothers, encouraging them to increase their skills in taking care of the neonate, requesting for help of persons around them, answering questions, and summarizing.

The mean and standard deviation of mothers' age was 25.23 ± 1.31in the intervention group and 24.11 ± 1.15 in the control group along with other demographic information, no significant difference between the two groups was observed (Table 2).

Table 2. Comparison of demographic information of neonates in two intervention and control groups, n = 60

Group Descriptives	Intervention n = 30 Mean ± SD	Control n = 30 Mean ± SD	P-value
Fetal age (week)	33.15 ± 1.82	32.05 ± 1.51	0.82
Age at discharge (day)	20.23 ± 1.94	18.10 ± 2.33	0.66
Birth weight (g)	1980.32 ± 185.10	1900.21 ± 150.26	0.93
Weight at discharge (g)	1995.15 ± 192.25	1950.17 ± 176.54	0.75

The results indicated that there was no statistically significant difference between the two groups in terms of education level, mother's occupation, and type of delivery (Table 3).

The mean perceived stress of mothers decreased significantly after the intervention in the intervention group (Table 4) (P = 0.03).

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Table 3. Comparison of mothers' education level, occupation, and type of delivery in two intervention and control groups

Variable		Intervention group N = 30	Control group N = 30	P-value
Education level	High school diploma and less Associate diploma and BS/BA MSc/MA and PhD	8 (26.66) 21 (70.00) 1 (3.34)	9 (30.00) 18 (60.00) 3 (10.00)	0.84*
Mother's occupation	Housewife Self-employed Employed	23 (76.66) 0 (0) 7 (23.34)	21 (70.00) 3 (10.00) 6 (20.00)	0.72*
Type of delivery	CS Normal vaginal delivery	4 (13.33) 26 (86.67)	3 (10.00) 27 (90.00)	0.91*

* Chi-square

Table 4. Comparison of perceived stress in intervention and control groups before and after intervention

Parameter Descriptive	Intervention group N = 30 Mean ± SD	Control group N = 30 Mean ± SD	P-value
Perceived stress before intervention	25.10 ± 2.32	25.33 ± 3.12	0.84*
Perceived stress after intervention	21.24 ± 1.83	24.14 ± 2.81	0.02*
P-value	0.03**	0.85**	

* Independent t-test
** Paired t-test

Discussion

Higher levels of stress were experienced by mothers of premature neonates due to caring for premature neonates after discharge as well as being in emotional situations. The results of this study demonstrated that the perceived stress of mothers had a significant decrease in the experimental group after the intervention, compared to the control group, suggesting the effectiveness of telephone training in mothers with premature neonates. Telephone training led to the improvement of mothers' skills in the intervention group regarding post-discharge care, and as a result, their stress decreased.

Consistent with the results of the present study, Osman et al. revealed that an educational video about postpartum stress and a 24-hour support hotline to provide immediate answers to mothers' concerns in the post-discharge period reduces mothers' perceived stress (Osman, et al, 2014). In the study by Azizi et al., it was found that a significant percentage of newly trained mothers trained after giving birth experienced less stress in comparison with the control group (Azizi, et al, 2010). The study by Jafarzadeh on the effect of telephone counseling on the stress of mothers with premature neonates proved that the mean stress score of the intervention group was significantly lower than the control group. Considering the positive effects of telephone training on diminishing the stress of mothers with premature neonates, it was suggested to use this support method to decrease mothers' stress (Jafarzadeh, et al, 2019). In a study examining the impact of telephone monitoring for mothers of premature neonates discharged from the hospital on rehospitalization of neonates, it was discovered that readmission four weeks after the intervention was significantly lower in the intervention group compared to the control group. Furthermore, hospitalization was significantly lower in the intervention group than in the control group in the third month following the intervention. As a result, education by telephone was introduced as a cost-

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effective way to encourage and support mothers of premature neonates after discharge (Ahmadpour-Sefidkoohi, et al, 2022); the case is in line with the results of this study. In this regard, Asghari et al. (2021) expressed that it is expected that after the development of legal, professional, and ethical infrastructures, telephone training will be integrated into the neonatal care programs admitted in the NICU. The use of this low-cost and economical method is recommended to reduce the stress of mothers (Asghari, et al, 2021). In one study regarding the effect of education and empowerment of mothers with premature infants on their health and quality of life, it was detected that there was no significant difference between the control group and intervention group after training, which is not consistent with the results of the current study (Hosseinpour, et al, 2022).

After hospitalizing the newborn in the NICU, mothers frequently feel powerless and helpless; therefore, they may be more stressed and vulnerable to emotional difficulties than mothers of full-term babies (Clottey and Dillard, 2013). Indeed, previous studies about this topic manifested that mothers with premature newborn birth and NICU admission significantly felt more stressed than their husbands (Ionio, et al, 2016). Regarding the effectiveness of telephone training in reducing the stress of mothers participating in this research, it can be presented that the training in baby care skills results in acquiring more knowledge of mothers about how to take care of their infant and comprehending the strengths and weaknesses. They can modify their weaknesses and try to reinforce their strengths. Awareness about abilities assists them in utilizing more efficient and appropriate methods in dealing with problems and, as a result, reduces their stress. Considering the positive effect of telephone training on decreasing mothers' stress, it is suggested to empower mothers by implementing such programs to effectively communicate with their infants and acquire the necessary skills for caring for them after discharge from the hospital. More studies should be conducted in the field of strategies to reduce stress in mothers of premature neonates.

One of the limitations of the current research was the individual differences of mothers that could affect their stress. This limitation was overcome by randomization as much as possible. Besides, this study was conducted only in a hospital in Yazd, central Iran, which restricts the generalizability of the findings, thereby jeopardizing the external validity of the study.

Conclusion

The results of the present study revealed that telephone health training is an effective and low-cost method for decreasing the perceived stress of mothers with premature infants discharged from NICUs. It is recommended for improving maternal and neonatal health. By comprehensive intervention strategies in the form of educational activities in health care systems to reduce mothers' stress, it is possible to effectively improve the growth of mental, social, and emotional health of mothers and neonates in the post-discharge period.

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Conflict of interests

The authors hereby declare that there is no conflict of interest.

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Ethical considerations

The informed consent form was signed by the participants. Participation was considered voluntary and participants' status and other data

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written on the questionnaire were not disclosed to keep their data confidential. The Committee of Ethics in Human Research at Shahid Sadoughi University of Medical Sciences, Yazd, approved this research.

Code of ethics

IR.SSU.REC.1400.134

Authors' contribution

Conceptualization, H.T. and Z.P.; Methodology, H.T., Z.P. and M.A.; Analysis, H.T. and Z.P.; Article Writing, Z.P.

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