

Teach-Back Training to Enhance Self-Efficacy among Mothers of Preterm Infants: A Quasi-Experimental Study

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Abstract

Background Mothers of premature infants need adequate knowledge, skills, and confidence to cope effectively with the challenges associated with neonatal intensive care. Identifying educational strategies that strengthen maternal self-efficacy is therefore essential. This study aimed to examine the effect of teach-back-based education on the self-efficacy of mothers of premature infants admitted to the neonatal intensive care unit (NICU).

Methods This quasi-experimental study was conducted among 66 mothers of premature infants hospitalized in the NICU of Shahid Rahimi Hospital, Khorramabad, Iran, during 2022–2023. The control group received routine ward education, while in the intervention group, nurses—after completing a teach-back training workshop—used the teach-back method to educate mothers. Data were collected using a demographic information form and the Barnes Parental Self-Efficacy Questionnaire. Statistical analyses included paired t-test, independent t-test, Cohen's d effect size, chi-square, and Fisher's exact tests.

Results At baseline, there were no significant differences between the two groups in demographic characteristics or mean self-efficacy scores ($P > 0.05$). Following the intervention, a significant increase in mean self-efficacy scores was observed in both the intervention ($P < 0.001$, $d = 1.624$) and control ($P < 0.001$, $d = 0.675$) groups. However, the post-intervention mean self-efficacy score was significantly higher in the intervention group compared with the control group ($P = 0.001$, $d = 0.885$).

Conclusion Teach-back-based education had a stronger and more positive effect on the self-efficacy of mothers of premature infants than routine training. It is recommended that nurses integrate this method into routine care for mothers in NICUs and that nursing managers provide supportive conditions for implementing such retraining programs.

Keywords Teach-back communication, self efficacy, mothers, preterm infants

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1 Introduction

Infants born before 37 weeks of gestation are considered preterm and, due to the immaturity of their organs and physiological systems, are at increased risk of serious complications and even death.^[1,2] Approximately 15% of all preterm births worldwide occur before 32 weeks of gestation, indicating that these infants require more intensive and prolonged medical care.^[3] Iran is no exception; with an estimated 5,000 births occurring daily, about 12% are premature.^[4] These figures underscore the substantial challenges that preterm birth imposes on both the healthcare system and families. The prolonged hospitalization of preterm infants not only generates significant medical costs but also causes considerable psychological stress and anxiety for parents.^[5,6]

Evidence shows that the hospitalization of a preterm infant can be emotionally and psychologically distressing for parents, particularly mothers.^[7] Mothers of preterm infants in the complex and often overwhelming environment of the neonatal intensive care unit (NICU) frequently experience fear, anxiety, and uncertainty, factors that may disrupt maternal–infant bonding and lower maternal self-efficacy.^[8] Self-efficacy, defined as an individual's belief in their ability to perform the behaviors necessary to achieve desired outcomes, is a key determinant of a mother's confidence in caring for her preterm infant.^[9,10]

Low maternal self-efficacy, characterized by a lack of confidence and a perceived inability to provide appropriate care, may lead to hospital readmissions after discharge. Such readmissions increase healthcare costs, add psychological strain to mothers, and may adversely affect infant growth and development.^[11] Conversely, mothers with higher self-efficacy exhibit greater confidence in their caregiving abilities, thereby improving the quality of home care and reducing the risk of readmission.^[12,13]

In recent years, maternal self-efficacy has gained growing attention in research because of its association with several positive outcomes, including improved breastfeeding practices, greater adherence to treatment regimens, and lower rates of postpartum depression.^[14,15] Given the high prevalence of preterm births and their associated burdens, identifying effective interventions to enhance maternal self-efficacy has become a public health priority. Education plays a pivotal role in this process; by equipping mothers with essential knowledge and caregiving skills, healthcare professionals, particularly nurses, can empower them to participate actively and confidently in their infant's care.^[16,17]

Among available educational approaches, teach-back-based education has emerged as a promising method for improving maternal self-efficacy. This interactive strategy involves a cyclical process of instruction,

assessment of understanding, and feedback provision. By actively engaging mothers in learning and tailoring explanations to their comprehension level, teach-back education enhances knowledge retention and skill acquisition. Through continuous feedback, it enables mothers to improve caregiving competence while ensuring they fully understand critical care concepts and procedures. Reported benefits include higher quality of education, increased maternal engagement, and reduced infant readmission rates.^[18–20]

Multiple studies have shown that teach-back-based education improves patients' and community members' understanding and application of health-related information^[18,20,21] and has been particularly effective in promoting self-care among individuals with chronic conditions.^[22] One study also reported that this method improved the health literacy of mothers with preterm infants.^[18] However, its influence on other dimensions of care, especially maternal self-efficacy, remains insufficiently studied and warrants further investigation. Therefore, the present study aimed to determine the effect of teach-back-based education on the self-efficacy of mothers of premature infants admitted to the NICU.

2 Methods

This quasi-experimental study employed a pretest–posttest design with intervention and control groups. A total of 66 mothers of preterm infants admitted to the Neonatal Intensive Care Unit (NICU) of Shahid Rahimi Hospital, Khorramabad, Iran, participated in the study, which was conducted during 2022–2023.

The sample size was determined based on a 95% confidence level ($\alpha = 0.05$), 80% statistical power ($\beta = 0.20$), and the mean and standard deviation of self-efficacy scores reported by Hoseinpour et al.— 33.05 ± 11.7 before the intervention and 66.15 ± 4.56 after the intervention.^[23] Using these parameters, the required sample size was calculated to be 29 participants per group. To account for an anticipated attrition rate of 10%, the final sample size was increased to 33 participants in each group.

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta} \right)^2 (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)^2}$$

Eligibility Criteria

For mothers: Inclusion criteria were as follows: age ≥ 18 years; at least basic literacy in reading and writing; absence of depression or presence of only mild depression and anxiety, defined as an anxiety score below 14 on the 21-item Depression, Anxiety, and Stress Scale (DASS-21);

having a preterm infant with a gestational age between 28 and 37 weeks and a birth weight of 1000–2500 g; no congenital anomalies in the infant; no maternal history of substance use or marital problems (based on self-report); not being a single parent; absence of communication difficulties such as deafness, blindness, or unclear speech; and no prior experience of having a preterm infant.

Exclusion criteria included infant death during the study, infant transfer to another healthcare facility for continued treatment, maternal withdrawal from the study, absence from more than one educational session, and inability to attend the NICU during the intervention period.

For nurses: Inclusion criteria were willingness to participate in the study, possession of at least a bachelor's degree in nursing, and a minimum of three months of work experience in the NICU.

Sampling Method

Convenience sampling was used to recruit mothers who met the inclusion criteria. The control group was sampled first. To enhance comparability between the control and intervention groups and to minimize potential confounding factors, group matching was performed based on gestational age, infant gender, birth order, and maternal education. After data collection for the control group, the distributions of these variables were examined. Gestational age was categorized into three groups (28–32 weeks, 33–34 weeks, and 35–37 weeks); infant gender into two groups (male and female); birth order into two groups (first-born and second or later); and maternal education into three groups (below diploma, diploma, and above diploma). Sampling for the intervention group was then conducted to match these distributions as closely as possible to those of the control group.

Nurses were selected through a census method according to the inclusion criteria. In coordination with the ward and educational supervisors, efforts were made to minimize nurse rotation during the study period to maintain intervention consistency.

Data Collection Tools

Data were collected using two instruments: demographic characteristics form and the Parental Self-Efficacy Questionnaire developed by Barnes et al. The demographic form collected information about mothers, preterm infants, and nurses. Maternal variables included age, parity (primiparous or multiparous), education level, occupation, family income, history of chronic illness or miscarriage, type of delivery, and availability of family or spousal support in infant care. Infant-related variables comprised gestational age, birth weight, gender, length of hospital stay, birth order, and Apgar score. The form was completed before the intervention by one of the researchers through maternal interviews and review of the infants' medical records. The content validity of the

form was evaluated qualitatively by ten faculty members of the Khorramabad School of Nursing and Midwifery and approved after revisions based on their feedback.

Instruments

The Parental Self-Efficacy Questionnaire, developed by Barnes et al., is a standardized tool for assessing parental self-efficacy among mothers of preterm infants hospitalized after birth. The questionnaire contains 20 items across four dimensions: caregiving processes (4 items), stimulating behaviors (7 items), understanding behaviors or messages (6 items), and situational beliefs (3 items). Each item is rated on a four-point Likert scale ranging from strongly agree (score 4) to strongly disagree (score 1). The total score ranges from 20 to 80, where scores of 20–45 indicate low self-efficacy, 46–65 moderate self-efficacy, and 66–80 high self-efficacy. The instrument has demonstrated excellent internal consistency (Cronbach's $\alpha = 0.91$) and test–retest reliability ($r = 0.96$).^[24]

In Iran, the tool was translated and validated by Aliabadi et al. (2012) for use among mothers of relatively stable hospitalized preterm infants, yielding a Cronbach's α of 0.86 for the total scale.^[25] In the present study, the questionnaire was self-administered by mothers before the intervention and again at the time of infant discharge, under the supervision of a researcher who was available to clarify any questions.

Study Procedure

The study was conducted in five stages. To prevent information transfer between groups, sampling for the control group was completed first. Mothers in this group received the routine educational services typically provided by ward staff. In this hospital, discharge education is delivered by an educational nurse at the time of discharge and covers the following topics:

- Breastfeeding and milk expression techniques
- Feeding with breast milk or specialized formula
- Maternal nutrition
- Kangaroo mother care
- Infant massage
- Personal hygiene and infection prevention
- Breast milk storage and feeding methods

Families were also informed about necessary specialized follow-up procedures such as electroencephalography (EEG), magnetic resonance imaging (MRI), bilateral hip ultrasonography, and retinopathy of prematurity (ROP) screening within the first 28 days after birth. Additional recommendations included a second thyroid test, hearing screening within 24–48 hours post-discharge, and visual assessments at primary healthcare centers.

Mothers received written instructions regarding infant feeding and were advised to seek medical attention if warning signs—such as poor weight gain, jaundice, lethargy, fever, cyanosis, or vomiting—appeared. Post-discharge follow-up was conducted by the educational nurse via telephone within 24–48 hours after discharge to assess breastfeeding practices, management of NICU-related complications, and parental caregiving. Mothers were encouraged to contact the NICU for any additional concerns after discharge.

Routine education in this ward was typically provided one to two days before discharge, either individually or in groups, and delivered orally by the educational nurse. When mothers were unavailable, the same instructions were given to fathers or other close relatives.

Educational Intervention

In the second stage, an educational package was developed using authoritative and evidence-based sources. The existing routine educational content provided in the ward was comprehensively reviewed, updated, and expanded through an extensive literature search. The revised materials were then compiled into a structured, standardized package. The package addressed key topics, including proper handwashing with disinfectant solution; correct diaper changing; milk preparation and storage; infant sucking exercises using a pacifier, finger, or breastfeeding; exclusive breastfeeding; proper breastfeeding technique and burping; feeding frequency and adequacy criteria; sleep facilitation and recommended sleeping positions; kangaroo mother care (KMC); infant massage; bathing and other aspects of skin care; recognition of warning signs; managing infant crying; medication administration; normal growth and vaccination schedules; post-discharge care, follow-up, and screening; and neonatal resuscitation tailored to gestational age and clinical condition.

Content validity of the educational package was evaluated and confirmed by five expert faculty members, who reviewed the materials for clarity, comprehensibility, and appropriateness. Revisions were made based on their feedback.

In the third stage, all NICU nurses were trained to deliver the educational package to mothers using the teach-back method. Nurse training was conducted through two one-hour virtual sessions and two two-hour in-person workshops, utilizing lectures, demonstrations, and repeated practice. Nurses were trained in two separate groups. During each session, the researcher initially presented the educational content, after which nurses were asked to restate the material in their own words. Any misconceptions or ambiguities were clarified, and training continued until proficiency was achieved.

The nurse training program comprised three main components:

1. Education on the importance of preparing mothers for discharge, enhancing their self-efficacy and self-esteem through active engagement, and reducing the likelihood of preterm infant rehospitalization.
2. Instruction on effective teaching strategies, emphasizing the principles and application of the teach-back method.
3. Comprehensive training on the content of the educational package, specifically designed for mothers of preterm infants, using the teach-back approach.

In the fourth stage, nurses practiced implementing teach-back training with mothers over a two-week period. During this phase, the researcher was present in the NICU and directly observed each nurse on at least two occasions to assess adherence to the method. Constructive feedback and corrective guidance were provided as needed to ensure accurate and consistent implementation.

In the fifth stage, after confirming nurses' competence in applying the teach-back method, sampling for the intervention group commenced. Mothers in the intervention group received the updated educational package in both written form and through teach-back training delivered by the trained nurses.

During each educational encounter, nurses first provided instruction using clear, nontechnical language. Mothers were then asked to restate the information in their own words. Maternal responses were deemed satisfactory if they accurately conveyed the intended content or demonstrated the skill correctly. If understanding was incomplete or inaccurate, the nurse repeated the instruction until comprehension was achieved. This iterative process continued until the nurse was confident in the mother's understanding and ability.

Discharge education for the intervention group began at the onset of the infant's hospitalization and was conducted face-to-face and individually by the ward nurses using the teach-back method. Practical demonstrations were employed for certain topics, such as medication administration using a syringe, dropper, or spoon, while instructional videos were used for procedures like infant bathing. Sessions were held in the mothers' room, with fixed times scheduled in coordination with the mothers and adjusted based on ward conditions and visiting hours. (Figure 1)

Complete information regarding the study objectives and procedures was provided to all participating mothers and nurses prior to enrollment. Written informed consent was obtained from each participant. Participants were informed about the voluntary nature of their participation, their right to withdraw at any stage, the confidentiality of collected data, and that study findings would be reported in aggregate form.

All data were entered into SPSS software, version 24 for analysis. Descriptive statistics, including absolute

and relative frequencies as well as measures of central tendency and dispersion, were used to summarize and categorize the findings.

Prior to comparing groups, data normality was assessed using the Shapiro–Wilk test. As the data were normally distributed, independent t-tests and paired t-tests were applied for between-group and within-group comparisons, respectively, before and after the intervention. Cohen's *d* was calculated to assess effect size. Additionally, the chi-square test and Fisher's exact test were used to compare qualitative variables between groups. A significance level of $P < 0.05$ was considered for all statistical analyses.



Figure 1 The flowchart of the study process

3 Results

The majority of the infants in the study were male (51.5% in the intervention group and 48.5% in the control group). The chi-square test indicated no significant difference between the groups in terms of gender distribution ($P = 0.805$). Similarly, no significant differences were observed between the groups for other demographic and clinical characteristics of the preterm infants, indicating that the groups were homogeneous in these respects (Table 1).

Table 1 Demographic and Clinical Characteristics of Neonates

Characteristics	Groups		P-value
	Intervention (Mean $\pm$ SD)	Control (Mean $\pm$ SD)	
Neonate birth age (weeks)	33.66 $\pm$ 2.14	33.91 $\pm$ 2.21	0.653*
Apgar score	8.39 $\pm$ 0.79	7.82 $\pm$ 0.91	0.906*
Length of hospital stay (days)	15.67 $\pm$ 8.72	16.91 $\pm$ 7.88	0.546*
Weight at discharge (grams)	1988.94 $\pm$ 436.28	1931.21 $\pm$ 390.21	0.448*
Age at discharge (days)	14.73 $\pm$ 7.57	17.72 $\pm$ 8.28	0.573*

*Independent t-tests

Between-group comparisons of maternal demographic characteristics and pregnancy history revealed no significant differences, indicating that the groups were homogeneous with respect to these variables ($P > 0.05$) (Table 2).

In the intervention group, a significant within-group increase was observed in mean maternal self-efficacy scores from baseline to post-intervention ($P < 0.001$, $d = 1.624$). Similarly, the control group showed a significant within-group increase in mean maternal self-efficacy scores over the same period ($P < 0.001$, $d = 0.675$). At baseline, no significant between-group differences were observed in mean self-efficacy scores or their subscales among mothers of preterm infants admitted to the neonatal intensive care unit ($P > 0.05$). However, following the intervention, a significant between-group difference was detected ($P = 0.001$, $d = 0.885$) (Table 3).

4 Discussion

This study investigated the effect of teach-back education on the self-efficacy of mothers of preterm infants admitted to the neonatal intensive care unit (NICU). Overall, mean self-efficacy scores and their dimensions increased significantly in both the intervention and control groups in within-group comparisons. However, the increase was greater in the intervention group. Following teach-back education, between-group differences became statistically significant, and the effect size of teach-back education was larger compared to the control group. Specifically, the control group, which received standard routine ward education, demonstrated a moderate effect size, whereas the intervention group, which received teach-back education, exhibited a strong effect size.

No significant differences were observed between groups in demographic characteristics, clinical variables, or maternal self-efficacy at baseline, indicating comparability. Therefore, it can be inferred that the intervention was the primary factor influencing the observed outcomes.

Table 2 Demographic Characteristics and Maternal Pregnancy History

Characteristics		Groups		p-value
		Intervention group n (%) / Mean $\pm$ SD	Control group n (%) / Mean $\pm$ SD	
Maternal Age	(Mean $\pm$ SD)	31.64 $\pm$ 5.91	30.94 $\pm$ 6.48	0.650*
Maternal Education	Non-academic	26 (78.8)	29 (78.9)	0.511**
	Academic	7 (21.2)	4 (12.1)	
Maternal occupation	Housewife	31 (93.9)	28 (84.8)	0.427**
	Employed	2 (6.1)	5 (15.2)	
	One	14 (42.5)	13 (39.4)	
Number of children	two	8 (24.2)	13 (39.4)	0.347**
	Three or more	11 (33.3)	7 (21.2)	
Birth order of infant	first	14 (42.5)	13 (39.4)	0.942**
	Second or more	19 (57.5)	20 (60.6)	
History of abortion	yes	9 (27.3)	12 (36.4)	0.598**
	no	24 (72.7)	21 (63.6)	
Type of delivery	Vaginal	5 (15.2)	6 (18.2)	0.999**
	Cesarean	28 (84.8)	27 (81.8)	
Number of deliveries	First	16 (48.5)	13 (39.4)	0.249**
	Second	6 (18.2)	12 (36.4)	
	Third	11 (33.3)	8 (24.2)	
History of chronic disease	Yes	8 (24.2)	4 (12.1)	0.339**
	No	25 (75.8)	29 (87.9)	
Having a helper in infant care	Yes	19 (57.6)	23 (69.7)	0.443***
	No	14 (42.4)	10 (30.3)	

*Independent t-test; **Fisher's exact test; ***Chi-square test

Table 3 Between- and within-group comparisons of mean maternal self-efficacy scores and its dimensions before and after the intervention in the control and intervention groups

Variable	Groups	Mean (SD) Intervention	Mean (SD) Control	P value*	Cohen's d
Self-efficacy	Before intervention	68.91 (5.90)	67.67 (9.00)	0.510	0.885
	After intervention	78.57 (2.51)	73.97 (6.92)	0.001	
	Within-group	P < 0.001**, d = 1.624	P < 0.001**, d = 0.675	-	
Care process	Before intervention	13.81 (2.28)	13.18 (2.40)	0.274	0.848
	After intervention	15.81 (0.46)	14.69 (1.81)	0.001	
	Within-group	P < 0.001**, d = 0.970	P < 0.001**, d = 0.621	-	
Motivating behavior	Before intervention	23.67 (2.89)	24.18 (3.53)	0.520	0.572
	After intervention	27.48 (1.20)	26.33 (2.58)	0.025	
	Within-group	P < 0.001**, d = 1.327	P = 0.002**, d = 0.590	-	
Care beliefs	Before intervention	10.60 (1.17)	10.27 (1.64)	0.346	0.819
	After intervention	11.81 (0.46)	11.06 (1.22)	0.002	
	Within-group	P < 0.001**, d = 1.091	P = 0.014**, d = 0.451	-	
Perception of behavior	Before intervention	20.81 (2.01)	20.03 (3.05)	0.221	0.847
	After intervention	23.45 (1.15)	21.87 (2.36)	0.001	
	Within-group	P < 0.001**, d = 1.195	P = 0.003**, d = 0.554	-	

*Independent t-test; **Paired t-test; ***Cohen's d (effect size)

Overall, these findings provide strong evidence for the positive impact of teach-back education on the self-efficacy of mothers of preterm infants.

Several studies support these findings. Amini et al. reported that teach-back education significantly improves mothers' self-efficacy in caring for their children.^[19] Similarly, Hadian Shirazi et al. demonstrated that fathers' education to support their spouses increased maternal self-efficacy in the NICU, while no significant changes were observed in the control group.^[26] Ghoneim and Fathalla also reported that teach-back education enhanced self-care skills in mothers of children with cardiac defects.^[27]

Pouraboli et al. found that teach-back effectively enhanced self-efficacy among mothers of children undergoing open-heart surgery.^[28] A study evaluating stress management education in mothers of children with thalassemia reported that self-efficacy scores were significantly higher in the intervention group immediately after and one-month post-intervention, further supporting teach-back as an effective method for improving self-efficacy in mothers of children with chronic conditions.^[8]

Rabiee et al. compared preterm infant care education and auricular acupuncture in mothers of preterm infants. Both interventions reduced anxiety and improved general and breastfeeding self-efficacy, but improvements were more pronounced in the preterm care education group. Although no differences were observed in NICU length of stay, mean infant weight before discharge was higher in the intervention groups than in controls.^[29]

The impact of teach-back education can be explained by Bandura's theory of self-efficacy, which identifies self-efficacy as a key predictor of behavioral change. Individuals with higher self-efficacy are more likely to engage in self-management and self-care behaviors and respond effectively to health-related stressors.^[30]

Caregivers play a pivotal role in patient care; supporting them ensures continuity of care. Mothers, in particular, assume responsibility for their child's care, especially under critical conditions, while also attending to family needs. Teach-back education strengthens maternal self-efficacy, enabling nurses to enhance mothers' confidence and competence in infant care.^[31–33]

Prior studies also demonstrated that teach-back improves maternal health literacy, self-efficacy, and competence in infant care, reducing the risk of disease and rehospitalization.^[34,20] Unlike app-based education, which may offer limited interaction and feedback, teach-back includes repetition, review, and practical guidance, accelerating confidence and skill development.^[32]

Teach-back education equips mothers with the knowledge, skills, and feedback necessary to perform infant care tasks such as feeding, bathing, monitoring,

and medication administration. By encouraging mothers to demonstrate or verbalize their understanding, teach-back enhances confidence, competence, and adherence to discharge instructions.^[13,25,26,29,31,35] Improved maternal self-efficacy positively influences care quality, continuity, maternal and infant well-being, and reduces the risk of readmission and related complications.^[18,20,36] Implementing teach-back may also reduce healthcare costs and should be tailored to the specific needs of mothers and infants across different settings.^[29]

This study confirms that teach-back education improves self-efficacy among mothers of preterm infants in the NICU, thereby promoting continuity of care and potentially improving health outcomes. Nurses are encouraged to adopt teach-back as an effective educational strategy, and nursing managers should provide the necessary resources and support for its implementation.

Limitations of the study include initial challenges in engaging nurses, who perceived the intervention as time-consuming. This was addressed by explaining potential benefits for infant health and offering continuing education credits. Another limitation was the self-reported nature of the questionnaires, which may have been influenced by maternal emotional states. To minimize bias, mothers completed questionnaires at times they deemed appropriate.

Conducting the study in a single center and potential information exchange between groups also limited the use of randomized parallel sampling. Future research should consider multicenter clinical trials with larger sample sizes, random sampling, and longer follow-up to strengthen evidence. Additionally, future studies should examine long-term effects of teach-back education on NICU length of stay, readmission rates, and healthcare costs.

5 Conclusion

In summary, this study provides robust evidence that teach-back education significantly enhances the self-efficacy of mothers of preterm infants in the NICU compared to standard education. By actively engaging mothers in demonstrating and verbalizing their understanding, teach-back strengthens confidence, competence, and adherence to care instructions, which can improve infant outcomes, promote continuity of care, and potentially reduce healthcare costs. The findings align with previous research supporting teach-back as an effective method for improving maternal self-efficacy and health literacy. Despite limitations such as single-center design and self-reported measures, the results underscore the value of incorporating teach-back into routine NICU education. Future multicenter studies with larger samples and longer follow-up are recommended to

confirm long-term benefits on infant health, readmission rates, and healthcare utilization.

Declarations

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Artificial Intelligence Disclosure

This work was produced personally by the authors without the use of artificial intelligence

Authors' Contributions

All authors contributed to the conception and design of the study. Mozghan Mostafanezhad. was responsible for designing, conducting the research, writing and submitting the manuscript. Fatemeh Valizadeh was in charge of designing and conducting the research, writing and submitting the manuscript. Kimia Karami was involved in designing, conducting the research, and writing the manuscript. Rasool Mohamadi. was involved in analyzing the data and writing the manuscript.

Availability of Data and Materials

The datasets are available from the corresponding author at reasonable request.

Conflict of Interest

The authors declare no conflict of interest.

Consent for Publication

Not applicable.

Ethical Considerations

All ethical principles of research, including confidentiality, anonymity, voluntary participation, and the right to withdraw, were carefully observed. This study is part of the first author's master's thesis and was approved by the Ethics Committee of Lorestan University of Medical Sciences.IR.LUMS.REC.1401.245.

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References

1. Karnati S, Kollikonda S, Abu-Shaweesh J. Late preterm infants - Changing trends and continuing challenges. *Int J Pediatr Adolesc Med.* 2020;7(1):36-44.
2. Manuck TA, Rice MM, Bailit JL, Grobman WA, Reddy UM, Wapner RJ, et al. Preterm neonatal morbidity and mortality by gestational age: a contemporary cohort. *Am J Obstet Gynecol.* 2016;215(1):103.e1-.e14.
3. Ohuma EO, Moller A-B, Bradley E, Chakwera S, Hussain-Alkhateeb L, Lewin A, et al. National, regional, and global estimates of preterm birth in 2020, with trends from 2010: a systematic analysis. *The Lancet.* 2023;402(10409):1261-71.
4. Heidary S, Heidari H, Choopani R. Development of an educational module for mothers of premature infants admitted to the neonatal intensive care unit in Iran: a narrative review. *International Journal of Epidemiology and Health Sciences.* 2021;2(Continuous).
5. Osorio Galeano SP, Salazar Maya Á M. Preparing Parents for Discharge from the Neonatal Unit, the Transition, and Care of Their Preterm Children at Home. *Invest Educ Enferm.* 2023;41(1).
6. Sarda SP, Vanya M, Schwartz EJ, Sorrells K, Namba F, Hirano S, et al. Burden of Treatments for Respiratory Complications in Extremely Premature Infants: Interviews with Caregivers. *Biomedicine hub.* 2023;8(1):15-24.
7. Ionio C, Giannoni V, Colombo C, Ciuffo G, Landoni M, Banfi A, et al. Impact of maternal emotional experiences at birth and self-regulation in preterm children: The role of early interactions. *Journal of Neonatal Nursing.* 2023;29(1):43-9.
8. Worrall S, Christiansen P, Khalil A, Silverio SA, Fallon V. Associations between prematurity, postpartum anxiety, neonatal intensive care unit admission, and stress. *Front Psychiatry.* 2024;15:1323773.
9. Jajormaneh F, Ghazavi Z, Mehrabi T, Najafi M. The effect of stress management training program on self-efficacy mothers of children with thalassemia. *Journal of multidisciplinary care.* 2016;5(2):84-93.[Persian]
10. Shorey S, Lopez V. Self-Efficacy in a nursing context. *Health promotion in health care-Vital theories and research.* 2021:145-58.
11. Tognasso G, Gorla L, Ambrosini C, Figurella F, De Carli P, Parolin L, et al. Parenting Stress, Maternal Self-Efficacy and Confidence in Caretaking in a Sample of Mothers with Newborns (0-1 Month). *Int J Environ Res Public Health.* 2022;19(15).
12. Salarvand S, Ghazvineh S, Mousivand F, Ahmadi Gharaei H, Bitaraf S. Health literacy and its related factors as predictors for the breastfeeding self-efficacy in a western province in Iran. *BMC Public Health.* 2023;23(1):593.
13. Gómez-Rocha LD, Ospina-Romero AM. Promotion of self-efficacy in mothers with infants discharged from neonatal intensive care units. *Enfermería Intensiva (English ed.).* 2024 Jul 1;35(3):171-7.
14. Li L, Wu Y, Wang Q, Du Y, Friesen D, Guo Y, et al. Determinants of breastfeeding self-efficacy among postpartum women in rural China: A cross-sectional study. *PLoS One.* 2022;17(4):e0266273.
15. Ahmadienezhad GS, Karimi FZ, Abdollahi M, NaviPour E. Association between postpartum depression and breastfeeding self-efficacy in mothers: a systematic review and meta-analysis. *BMC Pregnancy Childbirth.* 2024;24(1):273.
16. Gavine A, Shinwell SC, Buchanan P, Farre A, Wade A, Lynn F, et al. Support for healthy breastfeeding mothers with healthy term

- babies. *Cochrane Database Syst Rev*. 2022;10(10):Cd001141.
17. Pinheiro SRCS, Gubert FdA, Martins MC, Beserra EP, Gomes CC, Feitosa MR. Self-efficacy and social support of mothers of preterms in neonatal unit. *Revista Brasileira de Saúde Materno Infantil*. 2023;23:e20210289.
 18. Yen PH, Leasure AR. Use and Effectiveness of the Teach-Back Method in Patient Education and Health Outcomes. *Fed Pract*. 2019;36(6):284-9.
 19. Amini N, Kashaki M, Rasoulo M, Borimnejad L. The Effect of Teach-Back Education on the Health Literacy Level of Mothers of Premature Neonates in the Neonatal Intensive Care Unit. *Critical Care Nursing*. 2021;14(3):12-20. [Persian]
 20. Cheng GZ, Chen A, Xin Y, Ni QQ. Using the teach-back method to improve postpartum maternal-infant health among women with limited maternal health literacy: a randomized controlled study. *BMC Pregnancy and Childbirth*. 2023;23(1):13.
 21. Klingbeil C, Gibson C. The Teach Back Project: A System-wide Evidence Based Practice Implementation. *Journal of Pediatric Nursing*. 2018;42:81-5.
 22. Pazirofteh S, Alilu L, Habibzade H, Rasoli J. The effect of an educational program based on the teach back method on adherence to diet and fluid restriction in hemodialysis patients referring to the educational-treatment centers of urmia medical science university in 2020. *Nursing and Midwifery Journal*. 2021;19(2):87-96.[Persian]
 23. Hoseinpour S, Borimnejad L, Rasooli M, Hardani AK, Alhani F. The Effect of Implementing a Family-centered Empowerment Model on the Quality of Life of Parents of Premature Infants Admitted to a Neonatal Intensive Care Unit. *Iran Journal of Nursing*. 2022;34(134):2-17. [Persian]
 24. Barnes CR, Adamson-Macedo EN. Perceived maternal parenting self-efficacy (PMP S-E) tool: Development and validation with mothers of hospitalized preterm neonates. *Journal of advanced nursing*. 2007;60(5):550-60.
 25. Aliabadi F, Borimnejad L, Kamali M, Rassafiani M, Nazi S. Perceived Maternal Parenting Self-Efficacy (PMP SE) tool: translation and face validation with Iranian mothers of hospitalized preterm neonates. *Iranian Rehabilitation Journal*. 2013;11(1):7-10. [Persian]
 26. Hadian Shirazi Z, Ghasemloo H, Razavinejad SM, Sharifi N, Bagheri S. The effect of training the fathers to support their wives on stress and self-efficacy in mothers of premature newborns hospitalized in NICU: a quasi-experimental study. *BMC Pregnancy Childbirth*. 2022;22(1):102.
 27. Ghoneim AA, Fathalla A. A randomized control trial: effects of teach back method on self-efficacy among mothers of children with congenital heart defects. *Journal of Nursing Education and Practice*. 2018;8(4):106-12.
 28. Pouraboli B, Taghipoor P, Abadian L, Ranjbar H, Begjani J. The effect of the teach-back method during patient discharge training on the self-efficacy of mothers of children undergoing open-heart surgery. *Iranian Journal of Pediatric Nursing*. 2023;9(3):106-14. [Persian]
 29. Rabiee N, Ghasempour Z, Abolhassani M, Haghighi NB. Comparing the effect of premature infant care training and performing auriculotherapy techniques on anxiety, general self-efficacy and breastfeeding self-efficacy of mothers with premature infants. *Iran J Nurs Midwifery Res*. 2023;28(6):772-8.
 30. Bandura A. Self-efficacy conception of anxiety. *Anxiety and self-focused attention*: Routledge; 2015. p. 89-110.
 31. Sohrabi M, Azizzadeh Forouzi M, Mehdipour-Rabori R, Bagherian B, Nematollahi M. The effect of a training program on maternal role adaptation and self-esteem of mothers with preterm infants: a quasi-experimental study. *BMC Womens Health*. 2021;21(1):296.
 32. Sharifi M, Heidari H, Choopani R, Deris F, Heidarzadeh M. Comparing the effect of face-to-face and app-based education on mothers with infants in Neonatal Intensive Care Unit. *Journal of Clinical Care and Skills*. 2023;4(1):33-8.
 33. Vance AJ, Pan W, Malcolm WH, Brandon DH. Development of parenting self-efficacy in mothers of high-risk infants. *Early Hum Dev*. 2020;141:104946.
 34. Alinejad-Naeini M, Razavi N, Sohrabi S, Heidari-Beni F. The association between health literacy, social support and self-efficacy in mothers of preterm neonates. *J Matern Fetal Neonatal Med*. 2021;34(11):1703-10.
 35. Motahari Niya H, Hojjati H. The impact of General Psychological Training on the self-efficacy of Mothers whose Children Undergoing Surgery in Taleghani Pediatrics Hospital in Gorgan, Iran. *Journal of Research Development in Nursing and Midwifery*. 2019;16(1):43-50.
 36. Jangjoo M, Moeini F. The effect of Teach-back Method during discharge on the stress and anxiety of mothers of babies undergoing open heart surgery. *Journal of Multidisciplinary Care*. 2023 Jun 30;12(2):83-8.