The Effect of Planned Education Provided to Mothers of Preterm Newborns on Mother's Selfconfidence

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ABSTRACT

Preterm newborns spend the first days of their lives struggling with life- threatening diseases in Neonatal Intensive Care Unit rather than with their mothers. The separation of mother and preterms decreased mother's selfconfidence. This study was designed to determine the effect of planned education provided to mothers of preterm newborns in neonatal intensive care unit on selfconfidence of mother. This quasi-experimental pre/post-test study included 104 mothers of premature newborns (50 control, 54 intervention). The intervention group was given a planned education program, whereas the control group received routine education instead. Data were collected via a questionnaire, and descriptive statistics, t-test, and paired t-test were used to analyze selfconfidence levels before and after education. The mean scores of mothers in the intervention and control groups on the Pharis Selfconfidence Scale before to training did not change statistically significantly (t=1,174; p=,243). Mothers in the intervention group scored higher on average on the Pharis Selfconfidence Scale than mothers in the control group, and the difference was statistically significant (t=-8,74;p=,000). The conclusion drawn is that planned education was more effective in raising the mothers' selfconfidence when it came to caring for preterm newborns. Family-centered care and structured discharge education are recommended to enhance maternal confidence. Future studies should compare AI-supported and traditional education methods for their effectiveness.

Keywords: mother, planned education, preterm newborn, neonatal intensive care unit, selfconfidence.

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Preterm Yenidoğan Annelerine Verilen Planlı Eğitimin Annelerin Özgüvenine Etkisi

ÖZET

Preterm yenidoğanlar, yaşamlarının ilk günlerini anneleriyle değil, Yenidoğan Yoğun Bakım Ünitesi'nde yaşamı tehdit eden hastalıklarla mücadele ederek geçirmektedir. Anne ve preterm yenidoğanların ayrılığı, annelerin özgüvenini azaltmaktadır. Bu çalışma, yenidoğan yoğun bakım ünitesinde preterm yenidoğanların annelerine verilen planlı eğitimin annelerin özgüveni üzerindeki etkisini belirlemek amacıyla yapılmıştır. Yarı deneysel, ön test-son test kontrol deseninde gerçekleştirilen çalışmaya pretermbebek annelerinden 104 kişi (50 kontrol, 54 müdahale) dahil edilmiştir. Kontrol grubuna rutin eğitim verilirken, müdahale grubuna planlı eğitim programı uygulanmıştır. Veriler anket formu aracılığıyla toplanmış; tanımlayıcı istatistikler, t-testi ve eşleştirilmiş t-testi kullanılarak eğitim öncesi ve sonrası özgüven düzeyleri analiz edilmiştir. Müdahale ve kontrol grubundaki annelerin eğitim öncesi Pharis Özgüven Ölçeği puan ortalamaları karşılaştırıldığında, aradaki farkın istatistiksel olarak anlamlı olmadığı görülmüştür (t=1,174; p=,243). Ancak eğitim sonrasında, müdahale grubundaki annelerin ölçek puan ortalamalarının kontrol grubuna kıyasla daha yüksek olduğu ve bu farkın istatistiksel açıdan anlamlı olduğu belirlenmiştir (t=-8,74; p=,000). Bu sonuçlar, planlı eğitimin annelerin preterm bebek bakımına ilişkin özgüven düzeylerini artırmada daha etkili olduğunu ortaya koymaktadır. Anne özgüvenini artırmak için aile merkezli bakım ve yapılandırılmış taburculuk eğitimi önerilmektedir. Gelecekteki çalışmaların, yapay zekâ destekli ve geleneksel eğitim yöntemlerinin etkinliğini karşılaştırması önerilmektedir.

Anahtar Kelimeler: anne, planlı eğitim, pretermyenidoğan, yenidoğan yoğun bakım ünitesi, özgüven.

INTRODUCTION

Globally, approximately 13 million preterm newborns are born each year. (Mu, Lee, Chen, Yang & Yang, 2020). Preterm neonates differ physiologically and structurally from term newborns. These differences are accompanied by numerous health problems, and as a result, the majority of preterm newborns are hospitalized in neonatal intensive care units (NICU) for extended periods for monitoring and treatment. (Reihani, Sekhavat Poor, Heidarzadeh, Mosavi & Mazlom, 2014).

Admission of a preterm newborn to the NICU, regardless of the reason, is a stressful process for both the newborn and the mother (Doğru & Topan, 2021; Hunt et al., 2019). This situation negatively affects mothers' understanding of their role in neonatal care and their self-efficacy, leading to problems such as fear, anxiety, and lack of confidence. (Dos Anjos, Nakato, Hembecker, Nohama & Sarquis, 2022; Steyn, Poggenpoel & Myburgh, 2017). Studies have shown that mothers with adequate knowledge of postpartum and neonatal care exhibit greater confidence in caring for their newborns and demonstrate a stronger willingness to fulfill their responsibilities (Kara, Uçan & Güzel, 2017; Öztürk & Erci, 2016). In the NICU, involving mothers in newborn care contributes positively to discharge preparedness and improves long-term outcomes for both mother and newborn. (Adama, Adua, Bayes & Mörelius, 2021; Küçükoğlu, Aytekin & Gülhaş, 2015). The literature indicates that mothers of preterm newborns often experience difficulties in touching, caring for, and feeding their babies. (Adama et al., 2021; Ding et al., 2019). Furthermore, mothers of neonates hospitalized in the NICU continue to require knowledge and skills after discharge (Tiryaki, Zengin, Çınar, Umaroğlu & Latour, 2020). Home visits conducted following discharge have revealed that mothers may particularly need support within the first week in areas such as breastfeeding, newborn hygiene, and recognizing danger signs related to the newborn. (Yılmaz, Bayar & Esenay, 2018). A systematic review of qualitative studies investigating how prepared mothers of preterm newborns feel for discharge from the NICU concluded that discharge preparation should begin at the time of birth and continue throughout the hospitalization period (Taylor & Hambridge, 2025). Therefore, discharge planning in the NICU has become inevitable. (Bernardo, Rent, Arias-Shah, Hoge & Shaw, 2021).

Discharge education has been reported to be effective in maintaining newborn health, enhancing parents' knowledge, skills, and selfconfidence, and reducing anxiety during the transition to home. Moreover, it has been shown to positively influence neonatal health outcomes, reduce the risk of infections, and improve overall health status. (Kerkez & Kaplan, 2025). Hence, to prevent adverse

conditions in the postpartum period, it is essential for healthcare professionals to provide parents with planned education and support regarding postpartum and neonatal care. (Larsson, Wågström, Normann & Blomqvist, 2017; Şayık & Örsal, 2019). Nurses play a critical professional role by supporting mothers in developing confidence in newborn care, strengthening the mother-newborn bond, and guiding mothers in evaluating their own behaviors. Regular support and interventions provided by nurses during the early postpartum period and throughout the first year are particularly influential in enhancing mothers' selfconfidence in neonatal care. (Razurel, Schweitzer, Dupanloup, Irion & Epiney, 2011; Yıldız & Akbayrak, 2014). Additionally, the discharge decision should be made individually, with the mother feeling ready and actively participating in the discharge process. In this context, it is emphasized that nurses and midwives should play an active role in providing mother-newborn care and breastfeeding support. (Gavine et al., 2022). Indeed, the World Health Organization (WHO) underscores the necessity of educating mothers in the postpartum period on newborn care, nutrition, and recognition of medical emergencies. (Bhal, 2022). Thus, providing discharge education to mothers after childbirth can support the health of both mother and child while helping to prevent difficulties that may arise during the postpartum period. (Kerkez & Kaplan, 2025).

Aim

The purpose of this study is to determine the effects of planned education provided to mothers of preterm newborns hospitalized in the NICU on their selfconfidence levels before and after discharge, as well as to evaluate how structured educational interventions can support mothers' readiness for caregiving, promote family-centered care, and facilitate a smoother transition from hospital to home.

METHOD

This study was designed as a quasi-experiment with an unmatched group.

Setting and sample

The sample of the study consisted of mothers of newborns who were admitted to the level II neonatal intensive care unit of a research and education hospital in Turkey. Prior to the study, sample size calculation indicated that, at a 5% significance level, with a medium effect size of 0.50 and a power of 80%, a total of 100 participants should be included across both groups. Considering potential data loss, it was planned to include 110 mothers in the study. However, since one mother in the intervention group and five mothers in the control group could not be reached at the post-test, a total of 104 mothers participated in the trial; 50 were in the control group and 54 were in the intervention group.

The admission capacity of the level II neonatal intensive care unit is 18 beds. Since mothers can interact with each other during visiting hours, data were first collected from the mothers in the control group, and subsequently from the mothers in the experimental group.

The inclusion criteria for mothers were defined as having a healthy singleton pregnancy, being open to communication and cooperation, having no history of auditory or speech impairments, not using any medication during pregnancy, having at least a primary school education, having no diagnosed psychiatric disorder, not conceiving through assisted reproductive treatment, and volunteering to participate in the study. For newborns, the inclusion criteria were defined as birth between 32 and 37 weeks of gestation, singleton live birth, birth weight between 1200 and 2000 grams, absence of congenital anomalies and not requiring any respiratory support. Exclusion criteria were identified as the need for postnatal resuscitation for newborns and the occurrence of intraoperative complications for mothers.

Data Collection Tools

1. **Mother and Newborn Information Form:** Prepared by the researchers in line with the literature, this form consists of a total of 13 questions regarding the demographic characteristics of the mothers and the newborns.

2. **Pharis Selfconfidence Scale:** Developed by Pharis (1978) (Pharis, 1978; Walker, Crain & Thompson, 1986). and adapted into Turkish by Çalışır (2003), the reliability coefficient of the scale was determined to be between 0.86 and 0.85 (Çalışır, 2003). This is a 13-item, 5-point Likert- type measurement tool that assesses parents' selfconfidence in relation to the daily care of their newborns. During administration, participants are asked to carefully read each statement and mark one of the options: "1 = Not at all," "2 = Disagree," "3 = Undecided," "4 = Partially agree," or "5 = Completely agree," without leaving any items blank. The Pharis Selfconfidence Scale has a minimum score of 1 and a maximum score of 65. Parents who score higher are more confident in their ability to care for their newborns. For the pre-test and post-test in this investigation, the scale's Cronbach's alpha values were.953 and.959, respectively.

Implementation of Data Collection Tools

During the pretest phase, all mothers were administered both the Mother and Newborn Information Form and the Pharis Selfconfidence Scale through face-to- face interviews. In the posttest phase, the Pharis Selfconfidence Scale was

re- administered to all mothers one month after discharge, in the hospital setting, prior to their scheduled follow-up examination.

Development of the Planned Education Program

The educational program was developed on the basis of data derived from guidelines of various international and national organizations and hospitals, evidence-based studies, and the professional experiences of the researchers. The finalized content was compiled into a booklet, which was distributed to the mothers in the intervention group at the time of discharge.

Therefore, the modules of the educational content were created considering these dimensions (Table 1).

Table 1. Program Modules of Planned Education

Module	Content of Planned Education	Average Duration
1. Preterm Newborn and Characteristics	- Definition of preterm newborn - Characteristics of preterm newborns - Definition of corrected age	15 minutes
2. Care of the Preterm Newborn	- Skincare - Care of mouth, nose, eyes, ears, umbilicus, genital area, and nails - Bathing - Room - Clothing - Safety - Holding the newborn	45 minutes
3. Nutrition of the Preterm Newborn	- Content and importance of nutrition - Feeding intervals and daily feeding amounts - Breastfeeding positions - Properties and benefits of breast milk - Storage conditions of breast milk - Characteristics of breast milk storage containers	45 minutes
4. Problems That May Occur in the First Year	- Causes of vomiting and points to consider - Causes of poor sucking and points to consider - Causes of crying episodes and points to consider - Causes of jaundice and points to consider - Causes of body temperature changes and points to consider - Causes of diaper dermatitis and points to consider	45 minutes

5. Post-Discharge Follow-Up	-	Discharge criteria	35 minutes
	-	General information on follow-ups	
	-	Stages of preterm outpatient follow-up plan	
	-	Vaccinations	
	-	Screening tests	

Pilot Study

A pilot study was conducted with ten mothers who were representative of the sample but not included in the study group. Feedback was obtained, and as a result of the pilot study, mothers reported that the content of the Planned Education Program was sufficient and that all their questions were answered.

Educational Intervention

The Planned Education Program is a comprehensive, evidence-based program developed for mothers of preterm newborns, consisting of five modules focused on preterm newborn care and the information mothers need. The modules were scheduled as follows:

1. Module: Preterm Newborn and Characteristics – Day 0
2. Module: Care of the Preterm Newborn – Day 1
3. Module: Nutrition of the Preterm Newborn – Day 2
4. Module: Problems That May Occur in the First Year – Day 3
5. Module: Post-Discharge Follow-Up – Day 4.

Control Group

The control group received routine discharge education provided by intensive care nurses without any additional intervention. The content of the routine education included breastfeeding education and information about the medications to be used at home. The Pharis Selfconfidence Scale was administered to all mothers in the control group both before the education and one month after discharge.

Data Analysis

All of the data was analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows, version 21.0. Standard deviations, averages, percentages, and frequencies were used to describe descriptive data. The assumptions of normality were evaluated using Skewness, Kurtosis, and Shapiro–Wilk statistics. For normally distributed variables, comparisons were performed with the paired-sample *t*-test, whereas non-normally distributed data were analyzed using the chi-square test. The internal consistency of the scales employed in the study was

assessed with Cronbach's alpha coefficient. A significance level of $p < .05$ was adopted for all statistical analyses.

RESULTS

The descriptive characteristics of mothers are shown in Table 2.

Table 2. Comparison of descriptive characteristics of the intervention/control group (n=104).

Descriptive data		Intervention group (n=54)		Control group(n=50)		χ^2 / p
		n	%	n	%	
Age	20-24	16	29.6	9	18.0	2.350 / 0.503
	25-29	14	25.9	15	30.0	
	30-35	16	29.6	15	30.0	
	35 and over	8	14.8	11	22.0	
Education status	Literate	14	25.9	11	22.0	1.442 / 0.486
	Primary education	24	44.4	28	56.0	
	High school	16	26.9	11	22.0	
Family type	Nuclear family	39	72.2	39	78.0	0.462 / 0.326
	Extended family	15	27.8	11	22.0	
Birth type	Vaginal	11	20.4	20	40.0	**4.781 / 0.024**
	Cesarean section	43	79.6	30	60.0	
Planned pregnancy	Yes	49	90.7	45	90.0	0.016 / 0.579
	No	5	9.3	5	10.0	
Baby' s week of birth	32-34	39	70.7	22	44.0	**3.756 / 0.041**
	34-37	15	29.3	28	56.0	

chi square, p< 0.05

The mean selfconfidence scores of the mothers in the intervention and control groups prior to the education were not statistically significant (t = 1.174; p = 0.243). Following the education, both groups demonstrated higher mean selfconfidence scores compared to their pre-education levels.

When examining the difference between the groups, the post-education mean selfconfidence score of the mothers in the intervention group (m=58.685) was found to be higher than that of the control group (m=48.360) mothers and this difference was statistically significant (t = 8.74; p = 0.000) (Table 3).

Table 3. Comparison of pretest/posttest Pharis Selfconfidence Scale mean scores of the experimental and control groups (n=104).

	n	Intervention mean±SD	n	Control mean±SD	t / p
Pre test	54	43.222±12.974	50	45.880±10.012	1.174/0.243
Post test	54	58.685±2.590	50	48.360±7.974	**-8.739/0.000**
t-testi, p<0.05					

The difference between the pre- and post-education mean selfconfidence scores of the mothers in the intervention group was found to be statistically significant (t = -10.068; p = 0.000). The post-education mean selfconfidence score of the intervention group mothers (m = 58.685) was higher than their pre-education mean score (m = 43.222).

Similarly, the difference between the pre- and post-education mean selfconfidence scores of the mothers in the control group was also statistically significant (t = -3.994; p = 0.000). The post-education mean score of the control group mothers (m= 48.360) was higher than their pre-education mean score (m= 45.880) (Table 4).

Table 4. Comparison of the intervention and control group's selfconfidence score averages before and after education (n=54).

Selfconfidence level before and after education	Pre test mean±SD	Post test mean±SD	t / p
Intervention group	43.222±12.974	58.685±2.590	**-10.068/0.000**
Control group	45.880±10.012	48.360±7.974	**-3.994/0.000**

Paired group t-test, p<0.05

DISCUSSION

One of the factors influencing the care and follow-up of preterm newborns after discharge from the NICU is the parents' confidence in their ability to provide care (Raffray, Semenic, Osorio Galeano & Ochoa Marín, 2014). In this respect, ensuring that parents feel confident in preparing for discharge is of particular importance. The literature indicates that parents often do not feel sufficiently confident after discharge and require both discharge education and post-discharge support (Osorio-Galeano, Ochoa-Marín & Semenic, 2017; Petty, Whiting, Green & Fowler 2018; Premji et al., 2018).

Parental selfconfidence is influenced by receiving education in newborn care, gaining hands-on experience, and feeling prepared for the maternal role (Şayık & Örsal, 2019). In a study by Umberger et al., 22% of parents reported that they did not feel like decision-makers in their newborn's care, emphasizing that enhancing parental involvement and empowerment in the NICU is key to supporting a safe transition home (Umberger, Canvasser & Hall, 2018). Accordingly, engaging parents in care from the time of NICU admission until discharge can reduce limitations and strengthen their sense of empowerment, thereby improving confidence in caring for their newborns (Taylor, & Hambridge, 2025). Consistent with the literature, parents who have sufficient knowledge of newborn care tend to demonstrate higher selfconfidence and greater willingness to fulfill their responsibilities (Kara, Uçan & Güzel, 2017).

In our study, no significant difference was observed between the groups in pre-education selfconfidence scores. However, post-education, the intervention group had significantly higher PSCS scores compared with the control group. These findings suggest that the planned educational program was more effective in promoting maternal selfconfidence than the standard education delivered by ward nurses, and that it played an important role in helping mothers cope with the challenges of newborn care. Another study have also reported that parents in intervention groups achieve higher PSCS scores than those in control groups (Batman & Şeker, 2019). supporting our findings. For instance, Cheng et al. (2018) in Taiwan compared the effects of structured education and the provision of an educational booklet on mothers' knowledge, skills, and confidence in newborn care. Both methods were found to enhance maternal confidence, although the positive effects of the booklet persisted longer (Cheng et al., 2018). In our study, mothers in the intervention group received both structured education and a neonatal care booklet at discharge, covering the content of the in-person education provided during the NICU stay. These results suggest that the booklet

further reinforced the effects of the planned education in enhancing maternal selfconfidence.

At the end of the first month, the posttest results indicated that both groups experienced significant increases in PSCS scores compared with baseline. As newborns grow, the frequency and quality of mother–newborn interactions increase, enabling mothers to become more familiar with their newborns, better understand the causes of distress, and meet their newborns' needs more effectively. The hospital where the study was conducted holds the designation of a "Mother and Baby Friendly Hospital," with a strong emphasis on maternal and neonatal health. As part of this policy, NICU nurses routinely provide mothers with education on breastfeeding and newborn nutrition. The literature further highlights the importance of providing adequate breastfeeding support to mothers of preterm newborns (Breivold, Hjaelmhult, Sjöström-Strand & Hallström, 2019). For these reasons, both the intervention and control group mothers demonstrated improved selfconfidence. Additionally, the increase in the control group's scores suggests that standard nurse-led education was also effective.

In conclusion, the findings of this study indicate that individualized, structured, and nurse-delivered educational interventions contribute meaningfully to enhancing maternal selfconfidence in the care of preterm newborns.

Study limitations

The current study has some limitations. In the Pharis Selfconfidence Scale, the seventh question, *"If the (male) baby is circumcised, perform care of the circumcision site"*, was left unanswered by the mothers since none of the male newborns were circumcised. In addition, the Pharis Selfconfidence Scale could not be administered to one mother in the intervention group and five mothers in the control group after discharge because they could not be reached; therefore, these six mothers were excluded from the study. The generalizability of the findings of this study is limited to mothers of preterm newborns born at 32–37 weeks of gestation. Furthermore, the small sample size restricted the generalizability of the study. The results of this study were evaluated quantitatively, which also constitutes a limitation in the interpretation of the findings. It is recommended that future research include both quantitative and qualitative evaluations.

CONCLUSION

In the study, while the mean selfconfidence scores of the mothers in the intervention and control groups were not statistically significant before the training, after the training, the mean selfconfidence scores of both groups were found to be higher.

In addition, the mean selfconfidence score of the mothers in the intervention group was higher than that of the control group. Based on these findings, it is recommended that family-centered care be provided from the time preterm newborns are admitted to the NICU and that discharge education be planned accordingly. In addition, considering the increasing use of digital solutions in health care today, it is also recommended to provide newborn care education to mothers through artificial intelligence–supported training tools and to compare these methods with traditional planned education programs. In this way, the potential contributions of AI-based interventions to mothers' selfconfidence and caregiving competence can be scientifically evaluated.

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Author contributions
Conceptualization, E.E.D. and A.K.; Methodology, E.E.B. and A.K.; Formal Analysis, E.E.B. and A.K.; Investigation, E.E.D.; Resources, E.E.D.; Writing – Original Draft Preparation, E.E.D and A.K.; Writing – Review & Editing, E.E.D. and A.K.; Visualization, E.E.D.; Supervision, A.K.

Conflicts of interest
The authors declare no competing interests.

Data availability
On reasonable request, the corresponding author will provide data sets created and/or examined during the current investigation.

Ethics approval
Ethics clearance The current study procedure was conducted in accordance with the 2008 revision of the 1975 Helsinki Declaration. The study received ethic approval from the Institute of Health Sciences, Marmara University's Non-Interventional Clinical Research Ethics Committee (approved date: 28.03.2014, permission number: 19). Permission was also received by the Kanuni Sultan Süleyman Education and Research Hospital, where the study was conducted (75231446/604.01.06/2018), and the General Secretariat of Clinical Research Ethics (88919140-663-08-08-E.293). The Pharis Selfconfidence Scale was used

in the study with the author's written consent. Participants were informed that any information they provided would be kept private, used exclusively for scientific research, and that they would be informed of the study's findings.

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