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**Original Article**

# EMPOWERING PARENTS THROUGH HEALTH EDUCATION: ENHANCING COMPETENCY IN PREMATURE INFANT CARE

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## ABSTRACT

**Background:** Premature birth remains a leading cause of neonatal morbidity and mortality globally. Parents of premature infants often face challenges in providing proper care after hospital discharge due to limited knowledge, inadequate caregiving skills, and a lack of readiness. Health education plays a vital role in improving parental competency and ensuring safe and effective home care.
**Objectives:** This study aimed to evaluate the effect of health education on improving the knowledge, caregiving skills, and readiness of mothers in caring for premature infants.
**Methods:** A quasi-experimental pre-posttest design was conducted involving 25 mothers whose premature infants were admitted to the neonatal unit of RSI Siti Hajar Sidoarjo. The intervention included structured health education using printed leaflets and direct nursing demonstrations. Data were collected through validated questionnaires and observation checklists before and after the intervention. Statistical analysis was conducted using the Chi-square test with a significance level of $p < 0.05$.
**Results:** Before the intervention, 76% of mothers demonstrated poor knowledge, 100% lacked caregiving skills, and 100% were unprepared for home care. Post-intervention, 76% exhibited good knowledge, 80% showed adequate caregiving skills, and 84% were ready to care for their infants. All improvements were statistically significant ($p = 0.000$).
**Conclusion:** Health education significantly improved maternal knowledge, caregiving skills, and readiness in caring for premature infants. It is recommended that structured educational programs be routinely integrated into neonatal discharge planning to support safe and effective home care.

**Keywords:** Health Education, Premature Infants, Parental Knowledge, Maternal Readiness, Neonatal Care.

## INTRODUCTION

Premature birth presents significant challenges not only for infants but also for their parents, particularly in preparing for post-discharge care. The separation of parents and their babies in Neonatal Intensive Care Units (NICUs) often contributes to emotional stress, lack of confidence, and inadequate caregiving skills (Hendy et al., 2024; Rajabzadeh, Zarei, Rezaei, & Yazdani, 2024). Studies have shown that this stress can manifest as anxiety, depression, and

impaired parent-infant bonding, further complicating the caregiving process (Hendy et al., 2024).

Health education interventions have emerged as crucial strategies to empower parents in caring for premature infants both during hospitalization and after discharge. Programs such as Kangaroo Mother Care (KMC), Mother-Infant Transaction Program (MITP), Creating Opportunities for Parent Empowerment (COPE), and Family Integrated Care (FICare) have demonstrated positive impacts on parental confidence, infant outcomes, and reduced hospital readmissions (Charpak et al., 2020; O'Brien et al., 2018). Kangaroo Care, in particular, facilitates thermal regulation, enhances bonding, and supports the initiation of breastfeeding (Charpak et al., 2020).

In Indonesia, where healthcare resources are often limited, there is a need for targeted education strategies. This study investigates the effectiveness of structured health education in enhancing maternal competence in premature infant care.

Family Integrated Care (FICare), which actively involves parents in routine infant care, has been associated with improved knowledge, caregiving skills, and parental readiness to care for premature infants at home (Hendy et al., 2024; O'Brien et al., 2018). These outcomes are crucial for minimizing the risk of complications after discharge and ensuring optimal infant development.

However, research evaluating the impact of structured health education in low-resource settings, such as Indonesia, remains limited. This study aims to evaluate the effectiveness of health education in improving parents' knowledge, skills, and readiness in caring for premature babies in the neonatal unit at RSI Siti Hajar Sidoarjo.

## METHODS

### *Study Design*

Study Design and Setting: A quasi-experimental pretest-posttest design was conducted at the Neonatal Unit of RSI Siti Hajar Sidoarjo, East Java, Indonesia. This facility was selected due to its high rate of premature births.

Quasi-experimental methods are commonly used in healthcare research where randomized controlled trials are not feasible due to ethical or logistical constraints (White, Oelke, & Friesen, 2020).

### *Settings*

The study was conducted in the Neonatal Care Unit of RSI Siti Hajar Sidoarjo, Indonesia, a secondary healthcare facility that provides specialized care for premature and low birth weight infants. The setting was selected due to the high volume of premature births and the need for structured educational interventions to support parental readiness for discharge. Hospital-based education interventions in neonatal wards have proven effective in improving parental confidence and care outcomes (Rajabzadeh et al., 2024; Sharma, Murki, Pratap, & Dutta, 2022).

### *Research Subject*

The research subjects consisted of parents (primarily mothers) of premature infants hospitalized in the neonatal care unit. Inclusion criteria included: (1) being a biological parent or primary caregiver of a premature infant (<37 weeks gestation), (2) willingness to participate in the education sessions, and (3) ability to communicate verbally and understand Bahasa

Indonesia. Exclusion criteria were parents of critically ill infants with terminal prognosis or parents who had previously received structured neonatal care training.

Parental engagement in NICU care has been shown to improve both short- and long-term outcomes for premature infants, while also enhancing parental well-being (Hendy et al., 2024; Tawiah, Opoku, Kumi, & Baiden, 2024).

***Instruments***

Three main instruments were used for data collection:

1. Knowledge Questionnaire: A structured, self-administered questionnaire adapted from previously validated tools (Sharma et al., 2022), covering domains such as nutrition, thermal regulation, danger signs, and hygiene practices. The questionnaire was tested for content validity and reliability (Cronbach's alpha > 0.80).
2. Skills Observation Checklist: A structured observational tool used by trained researchers to assess parental competency in basic infant care techniques (e.g., breastfeeding, KMC, diapering, hand hygiene). This checklist was developed based on WHO neonatal care guidelines and has been successfully used in recent NICU-based interventions (McCahon, Leick-Rude, & Weimer, 2023; World Health Organization, 2020).
3. Readiness Scale: A Likert-type scale measuring parental emotional and practical readiness to care for premature infants' post-discharge. It included items on confidence, stress levels, and perceived preparedness. Similar tools have been applied effectively in NICU discharge readiness studies (Sharma et al., 2022).

All instruments were piloted before the main study to ensure clarity and cultural relevance.

***Intervention***

The intervention in this study consisted of a structured health education program aimed at improving parental knowledge, skills, and readiness in caring for premature infants. The educational session was conducted during hospitalization in the neonatal unit and involved two main components:

1. Printed Educational Materials: Parents received a leaflet containing information about premature infant care, including thermoregulation, nutrition, hygiene, danger signs, Kangaroo Mother Care (KMC), and breastfeeding techniques.
2. Practical Demonstration: Nurses provided hands-on training directly at the bedside using role-playing and real-time demonstration on how to carry out key caregiving tasks.

Each educational session lasted approximately 60–90 minutes and was delivered individually to the mother (or primary caregiver) by trained neonatal nurses. Follow-up reinforcement and discussion were encouraged to ensure understanding and proper technique application. The post-test was administered one day after the intervention to measure its impact.

This approach aligns with recent findings emphasizing that targeted, individualized, and practical education significantly enhances parental competence in neonatal care (Lee, Park, & Lee, 2020; Olsson, Eriksson, & Anderzén-Carlsson, 2021).

***Data Collection***

Data collection in this study was conducted using both quantitative and observational methods:

1. Questionnaire: A structured questionnaire was used to assess parental knowledge regarding premature infant care. The instrument included items on basic infant needs,

emergency recognition, feeding practices, and home care routines. This was administered before and after the intervention (pre- and post-test design).

2. Observation Checklist: Skills and readiness were evaluated using a direct observation sheet during simulated care tasks. The checklist included criteria such as the correct implementation of KMC, appropriate feeding techniques, and hygiene maintenance.
3. Timing: The pre-test was conducted before the health education session. The post-test was performed one day after the intervention to assess short-term changes.

The data collection tools were pre-tested for validity and reliability. Trained enumerators assisted in data gathering under the supervision of the primary researcher.

This mixed-method approach enhances validity and captures the multidimensional outcomes of educational interventions (Arabi, Shahraki Sanavi, & Bagherian, 2022; Imdad, Yakoob, & Bhutta, 2020).

***Data Analysis***

The data analysis in this study employed a quantitative approach using a pre-post test design to evaluate changes in parental knowledge, caregiving skills, and readiness following the health education intervention. The analysis process began with data editing, coding, and tabulation to ensure completeness and consistency, followed by statistical testing. The primary statistical method used was the Chi-square ($\chi^2$) test, which is appropriate for comparing categorical variables between two related groups—in this case, before and after the intervention. A significance level of $p < 0.05$ was used to determine statistical relevance. This approach allowed the researcher to assess whether there were significant improvements in each outcome variable post-intervention. The use of Chi-square analysis aligns with best practices in quasi-experimental research focused on educational and behavioral interventions, particularly in maternal and child health contexts (Aryani, Wulandari, & Wahyuni, 2020; Ismail, Rahman, & Ahmad, 2022).

***Ethical Considerations***

This study adhered to established ethical principles for research involving human participants, especially vulnerable populations such as postpartum mothers of premature infants. Ethical approval was granted by the Ethics Committee of STIKES Husada Jombang before the commencement of data collection. Ethical safeguards implemented in the study included obtaining written informed consent from all participants after providing full disclosure regarding the study's purpose, procedures, potential risks, and benefits. Participation was entirely voluntary, with the assurance that participants could withdraw at any time without any repercussions. Data confidentiality was strictly maintained through anonymization and secure data storage. Furthermore, the intervention posed no physical or psychological harm to participants; rather, it was designed to empower and support them in caring for their premature infants. These procedures are consistent with the Declaration of Helsinki and contemporary ethical standards in maternal-child health research in Southeast Asia (Sutan & Mohd Nor, 2020; World Medical Association, 2018).

## RESULTS

A total of 25 mothers who had premature infants admitted to the neonatal room at RSI Siti Hajar Sidoarjo participated in this study. The characteristics of the respondents varied in terms of age, education level, and previous experience with premature infant care. Most

participants were in the 20–35 years age group, had secondary education, and lacked prior experience in caring for premature infants.

*Parental Knowledge*

Before the health education intervention, the majority of participants (76%, n=19) demonstrated low levels of knowledge regarding premature infant care, including feeding techniques, thermal regulation, and signs of neonatal emergency. After the intervention, a significant shift was observed, with 76% (n=19) of mothers showing good knowledge, as indicated by a Chi-square test result of $p = 0.000$. This result suggests a statistically significant improvement in parental knowledge following the health education session.

*Caregiving Skills*

In the pre-test phase, none of the participants (0%, n=0) demonstrated competent caregiving skills. Observational data showed that all respondents (100%, n=25) lacked adequate practical ability to perform basic tasks such as Kangaroo Mother Care (KMC), effective breastfeeding positioning, and infant hygiene. After receiving hands-on training, 80% (n=20) of the mothers were categorized as having adequate skills. This improvement was statistically significant ($p = 0.000$), indicating that the practical component of the health education was effective in enhancing caregiving competency.

*Readiness to Care for Premature Infants*

Before the intervention, all mothers (100%, n=25) were classified as not ready to independently care for their premature infants at home. This was assessed based on their self-reported confidence and observed preparedness. After the health education session, 84% (n=21) were classified as ready, indicating a substantial improvement in maternal readiness, which was also statistically significant with a *p*-value of 0.000.

These findings confirm that structured health education significantly improves maternal knowledge, caregiving skills, and readiness in caring for premature infants. This supports the implementation of health education as an essential component of discharge planning in neonatal care settings.

## DISCUSSION

This study found that health education significantly improved the knowledge, skills, and readiness of mothers in caring for premature infants. The pre- and post-test comparisons demonstrated notable gains in maternal competency across all three measured domains, with *p*-values $< 0.05$, indicating statistically significant changes. These findings align with previous studies highlighting the positive impact of structured parental education programs in neonatal settings (Ismail et al., 2022; Lee et al., 2020).

Improvement in knowledge is a critical outcome, as informed parents are better equipped to understand and respond to the complex needs of preterm infants. Before receiving the intervention, most mothers lacked accurate information about basic premature infant care, including thermal regulation, feeding practices, and danger signs. After the educational session, a majority showed a substantial improvement in their understanding. This confirms that accessible, comprehensible educational materials—such as leaflets—combined with verbal explanations, are effective strategies for enhancing parental knowledge (Arabi et al., 2022).

In terms of caregiving skills, the intervention resulted in a transformation from complete inexperience to practical proficiency in 80% of participants. Practical training, especially on Kangaroo Mother Care (KMC), feeding posture, and hygiene maintenance, empowered mothers with hands-on confidence. Research has emphasized the necessity of experiential learning in parental education, where visual demonstration and guided practice yield better outcomes than verbal instruction alone (Olsson et al., 2021). This approach supports the concept of "learning by doing," which is particularly effective in maternal and newborn health interventions.

The readiness of mothers to care for their premature infants also showed significant improvement post-intervention. Initially, most respondents expressed fear, uncertainty, and lack of confidence. Following the educational intervention, 84% reported feeling ready to manage their infant's care independently. Parental readiness is influenced not only by knowledge but also by psychological preparedness, which is often enhanced through supportive communication with healthcare providers (Sutan & Mohd Nor, 2020). This highlights the importance of emotional support as part of the discharge preparation process.

These results underscore the crucial role of nurses and midwives in delivering family-centered health education, particularly in neonatal intensive care units (NICUs). The findings support integrating structured education into routine care to reduce hospital readmissions, promote infant well-being, and improve parental autonomy. Furthermore, the study's approach, combining printed materials and direct coaching, represents a scalable model for use in both hospital and community settings.

While the study presents promising outcomes, it is not without limitations. The small sample size and single-site design may limit generalizability. Future studies should explore the long-term impact of health education on neonatal outcomes and consider digital platforms to enhance educational reach.

In conclusion, this study affirms that health education significantly enhances maternal competency in caring for premature infants. A comprehensive, skill-based approach should be adopted widely to support early discharge and safe home care practices.

## CONCLUSION

This study concludes that health education has a significant impact on enhancing parental competency in the care of premature infants. The intervention effectively improved the mothers' knowledge, caregiving skills, and readiness to care for their premature babies after discharge from the neonatal unit. Before the intervention, most parents demonstrated limited understanding, lacked practical caregiving abilities, and were unprepared for independent infant care. However, following the health education session—delivered through leaflets and hands-on demonstration—there was a notable increase in parental confidence, skill, and preparedness.

The findings affirm the importance of structured, family-centered health education as an integral part of neonatal care and discharge planning. By equipping parents with the knowledge and skills needed to care for premature infants, health education not only supports better health outcomes but also fosters parental empowerment and autonomy at home. Therefore, it is recommended that similar educational interventions be routinely implemented in neonatal care settings to ensure continuity of care and promote infant well-being after hospital discharge.

## SUGGESTION

Based on the findings and limitations of this study, several recommendations are proposed for practice and future research. First, healthcare providers, especially nurses working in neonatal units, should integrate structured health education into routine discharge planning for parents of premature infants. This should include both written materials and practical demonstrations to enhance understanding and skill acquisition. Second, future studies should consider using larger and more diverse samples across multiple institutions to improve the external validity of results. Longer follow-up periods are also recommended to evaluate the sustainability of the intervention's impact on parental behavior and infant health outcomes. Additionally, incorporating digital or mobile-based educational tools could expand accessibility and support continued learning at home. Finally, future research should explore the role of psychosocial support, including counseling and peer mentoring, to complement educational interventions and address emotional readiness more comprehensively.

## LIMITATIONS

This study has several limitations that should be considered when interpreting the findings. First, the sample size was relatively small (n = 25) and limited to a single hospital setting, which may restrict the generalizability of the results to broader populations or different healthcare environments. Second, the short follow-up period—only one day after the intervention—did not allow for assessment of long-term knowledge retention or sustained behavioral change. Third, the study relied on self-report and observational methods, which may be subject to response bias and observer subjectivity. Additionally, the study did not account for potential confounding variables such as maternal mental health, social support, or prior informal caregiving experience, which may influence outcomes independently of the intervention.

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