



Enhancing Readiness for Discharge through Effective Teaching: A Study on Low Birth Weight Mothers in NICU

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ABSTRACT

Maternal readiness for home care is crucial for optimal LBW outcomes. However, there are still many mothers who feel unprepared. The quality of discharge teaching provided to mothers is an important factor in this readiness. This study aims to determine the relationship between the quality of discharge teaching with discharge readiness in mothers of low birth weight (LBW) in the NICU. This study used a correlational method with a cross sectional approach. The study sample was 30 respondents based on inclusion and exclusion criteria using total sampling technique. Bivariate analysis with Fisher's exact test was used to analyze the data. Of the 30 respondents, 15 (50%) had a good level of discharge teaching quality, and 19 (63.3%) demonstrated good discharge readiness. The statistical test results demonstrated a significant relationship between the quality of discharge teaching and discharge readiness in mothers of low birth weight (LBW) in the NICU ($p\text{-value } 0.016 < \alpha 0.05$). Mothers who received high-quality discharge teaching had a higher proportion of readiness for discharge (75%) compared to mothers who received low/moderate quality teaching (16.7%). The quality of discharge teaching plays an important role in improving discharge readiness in LBW mothers. Therefore, efforts to improve the quality of discharge teaching are recommended through effective communication training for nurses, and use of interactive learning media.

Keywords: Low Birth Weight, Discharge Teaching, Discharge Readiness

1. INTRODUCTION

WHO (2022) defines Low Birth Weight Infants (LBW) as babies who are born with a body weight below the normal range, which is less than 2500 grams regardless of gestational age (Julianti, Rustina, & Defi, 2019). Data from the United Nation Children's Fund (UNICEF), in 2020 the percentage of LBW births in the world reached 14.7% of the total 19.8 million births. The incidence of LBW in South Asia is quite high at 24.4% (UNICEF & WHO, 2019). The results of the Basic Health Research in 2018, there were 6.2% LBW births in Indonesia out of 56.6% of toddlers who had birth weight records (Riskasdas, 2019). According to data from the Riau Provincial Health Office, in 2021

there were 1,637 cases or 1.3% of LBW incidents (Riau Provincial Health Office, 2021).

LBW are at high risk of health problems that can occur from birth, during hospitalization and continue until they are discharged home (Julianti, Rustina & Defi, 2019). LBW are at risk of experiencing various health problems, such as respiratory distress, difficulty feeding, poor body temperature regulation, infection, intracranial hemorrhage, hyperbilirubinemia, and hypoglycemia (Astutik & Ferawati, 2019; Li et al., 2020; WHO, 2022). LBW require intensive care in the Neonatal Intensive Care Unit (NICU) at the hospital to help develop

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their physiological functions (Solehati et al., 2018).

LBW care in the NICU is a challenging experience for parents, especially mothers, which can trigger various psychological problems such as fear, doubt and lack of confidence. Compared to mothers of healthy babies, the transition to parenthood for LBW mothers is also more difficult. Factors such as the unfamiliar NICU environment, heavy adaptation demands, lack of preparation in the role of parent, feelings of sadness and isolation, and uncertainty about the baby's future can worsen the mother's psychological condition. In addition, the relatively long duration of care in the NICU can further reduce the mother's confidence in caring for her baby. This condition can have an impact on the achievement of the mother's role and their readiness to care for the baby at home (Hariati, 2020).

Discharge readiness is the attainment of technical skills and knowledge, emotional comfort, and confidence (Gupta et al., 2019). Discharge readiness in LBW mothers leads to them being better able to provide the best care for their babies. Lack of discharge readiness in LBW mothers can lead to a number of problems, such as anxiety, delayed discharge, and doubt of competence in infant care, loss of confidence, higher healthcare utilization, and possible re-hospitalization of the infant (Hariati et al., 2020; Hariati et al., 2021; Salmani et al., 2020). This study focused on the discharge readiness of LBW mothers because the early period after discharge is a critical time for the baby and mother. Lack of support and adequate information during this period can have a negative impact on the health and development of the baby.

A key tool to help parents prepare to care for their child at home is discharge teaching (Chen et al., 2016). Discharge teaching is a key nursing strategy in preparing patients for discharge. Nurses' skills in helping patients understand the content of education & the effectiveness of teaching methods are important in the discharge teaching process. High-quality discharge teaching provided by nurses is an important element in a smooth transition and will assist parents in preparing for their baby's

discharge (Raphael et al., 2018; Seyedfarajollah et al., 2018)

High-quality discharge teaching can improve parents' readiness to go home from the hospital, which in turn can improve recovery rates and prevent complications (Weiss et al., 2017). Conversely, inadequate discharge teaching has been associated with adverse events after discharge such as medication errors or increased hospital readmission rates (Pellet et al., 2020). For example, errors in medication administration or infant home care techniques can be fatal if parents are not provided with clear and comprehensive information at discharge teaching.

In previous research conducted by Weiss et al. (2017) with the title "discharge teaching, readiness for discharge, and post-discharge outcomes in parents of hospitalized children" states that the quality of discharge teaching reported by parents (how nurses teach), but not the amount of content, is positively related to parents' perceptions ($B = 0.54$) and nurses' assessment ($B = 0.16$) of discharge readiness. Another study conducted by Nurhayati (2018) entitled "perception of the quality of discharge teaching and readiness for hospital discharge among surgical patients and nurses in Indonesia" the results of the study reflect that the quality of discharge teaching is not statistically correlated with readiness to go home from the hospital. However, for each subscale, the delivery subscale was positively associated with patients' knowledge and their coping ability subscales. Meanwhile, the received content subscale had a positive relationship with the expected support subscale in patient readiness. These inconsistencies raise important questions about the quality and effectiveness of current discharge teaching methods.

On December 29, 2023, researchers conducted pre-research at Arifin Achmad Hospital Pekanbaru. The results of the pre-research data obtained population data of LBW patients from January to December 2023. A total of 106 LBW patients who underwent treatment in the NICU room were identified based on the Medical Records of RSUD Arifin Achmad (2023). The researcher interviewed five mothers of LBW patients who were ready

to be discharged home. Three mothers stated that they already understood how to breastfeed and how to store breast milk. However, two mothers expressed anxiety and a lack of confidence in breastfeeding their babies. They specifically requested clearer information on the frequency and duration of breastfeeding, as well as signs of a hungry and full baby. This study aims to analyze the relationship between the quality of discharge teaching and readiness for discharge among mothers of low birth weight babies (LBW) in the NICU of Arifin Achmad Hospital Pekanbaru.

2. METHODS

The method used in this research is descriptive with a correlational approach. In this study, the independent variable is the quality of discharge teaching, while the dependent variable in this study is discharge readiness. This research was conducted after obtaining an ethical review letter on September 24, 2024 with letter number 1718/UN19.5.1.8/KEPK.FKp/2024 from the Ethics Committee of the Faculty of Nursing, Riau University.

The sample of this study consisted of the entire population of LBW mothers who were admitted to the NICU room for the last 3 months, totaling 30 respondents. The sampling technique used was total sampling. The decision to use total sampling was based on the consideration that the population was relatively small, making it possible to involve all members of the population in the study. The use of total sampling also allows researchers to obtain more comprehensive and representative data from the population under study, although it has limitations in generalizing the research results to a larger population.

This study used a data collection instrument in the form of a questionnaire. In this case, the questionnaires used by researchers were 3, namely: First, a characteristic questionnaire containing data on respondents' characteristics such as age, latest education and occupation. Second, the Quality Discharge Teaching Scale (QDTS) questionnaire to measure the quality of discharge teaching which has 2 subscales, namely the content received and the quality of teaching delivery. The QDTS questionnaire has

been tested for validity with a calculated r value in the range of 0.541 - 0.843, where r count $> r$ table (0.444), so the QDTS questionnaire is said to be valid and reliable. And third, the Indonesian version of the Readiness for Hospital Discharge Scale-Parent (RHDS-parent) questionnaire to measure discharge readiness which has been tested for validity by Hariati et al (2020) with an r value of 0.900. This questionnaire has 5 subscales namely parent's personal status, child's personal status, knowledge, coping skills and expected support.

The statistical test used in this study is the Pearson Chi Square test which is a non-parametric statistic used to determine whether the frequency in each category is different from what is expected by chance (LoBiondo-Wood and Haber 2021). Fisher's Exact test is an alternative test used if the Pearson Chi Square test results do not meet the requirements. The Pearson chi square test provides the results of bivariate analysis, namely the relationship between the quality of discharge teaching and discharge readiness in mothers of low birth weight (LBW) in the NICU. If the p value < 0.05 , then H_0 is rejected, meaning that there is a relationship between the quality of discharge teaching and discharge readiness in mothers of low birth weight (LBW) in the NICU.

In addition, this study also addresses potential biases that may arise, such as respondent bias in evaluating the quality of discharge teaching. Respondents' subjectivity in providing assessments can affect the results of the study. Therefore, the researcher attempted to minimize this bias by providing a clear explanation of the purpose of the study and ensuring respondent anonymity. Nonetheless, this bias remains a limitation that needs to be recognized in this study.

3. RESULT AND DISCUSSION

3.1 Respondent characteristics include age, latest education and occupation

Based on the data displayed in table 1, the characteristics of the 30 respondents who have been studied show that the majority of respondents aged 21-35 years, as many as 19 respondents (63.5%). meaning that respondents aged 21-35 years tend to experience LBW. The

results of this study are not fully in line with the theory put forward by Manuaba (2014), which states that maternal age <20 years or >35 years is a major risk factor for LBW. Research conducted by Rantung et al. (2015) reinforced this study which showed that out of 70 respondents, 22 were >20 years old, with 31.4% of them giving birth to LBW babies. In the non-risk age group, the proportion of LBW was recorded at 21.4%.

Table 1. Respondent characteristics include age, latest education and occupation

Characteristics	Frequency	Percentage%
Age		
a. < 20 years	1	3,3%
b. 20-35 years	19	63,5%
c. > 35 years	10	33,2%
Totally	30	100,0%
Final Education		
a. Elementary school/ equivalent	4	13,3%
b. Junior high school/equivalent	2	6,7%
c. Senior high school / equivalent	15	50%
d. College	9	30%
Totally	30	100%
Employment		
a. Not working	15	50%
b. Self-employed	8	26,7%
c. Retired	1	3,3%
d. Civil servant	6	20%
Totally	30	100%

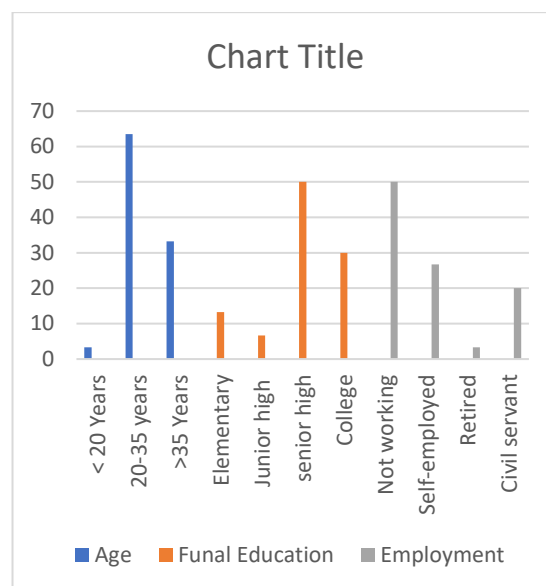


Figure 1. Respondent characteristics include age, latest education and occupation

The majority of respondents have a high school / equivalent final education, as many as 15 respondents (50%). The results of this study are not in line with the results of research by Demelash et al. (2015) which showed that respondents with low education were six times at risk of LBW. The results of this study are also different from the findings of Mardiah (2019), which reported that most respondents had a primary school education, as many as 28 people (66.7%), followed by junior high school graduates as many as 11 people (26.2%), and those with no education as many as 3 people (7.1%). Most respondents did not work, totaling 15 respondents (50%). The results of this study are in line with Fransiska's research (2020) which showed that out of 41 respondents, 23 respondents (56.1%) did not work or were housewives. On the other hand, this study is not in line with Puspitasari's research (2014) which reported that out of 46 respondents, 31 working mothers (33.7%) gave birth to LBW.

3.2 Quality of discharge teaching for mothers with LBW in the NICU.

Table 2 shows the frequency distribution data of respondents based on the quality of discharge teaching in LBW mothers, the majority of respondents had good discharge teaching quality, namely 15 respondents (50%). The quality of discharge teaching for LBW mothers was determined by filling out the

Quality Discharge Teaching Scale (QDTS) questionnaire. The QDTS score range is 0 to 250. The details of the distribution of discharge teaching quality are as follows: poor (<7), moderate (7-8), good (8-9), and excellent (>9) (DiFazio et al., 2023).

Table 2. Overview of respondents based on the quality of discharge teaching

Characteristics	Frequency	Percentage%
Less	3	10%
Medium	3	10%
Good	15	50%
Very good	9	30%
Totally	30	100%

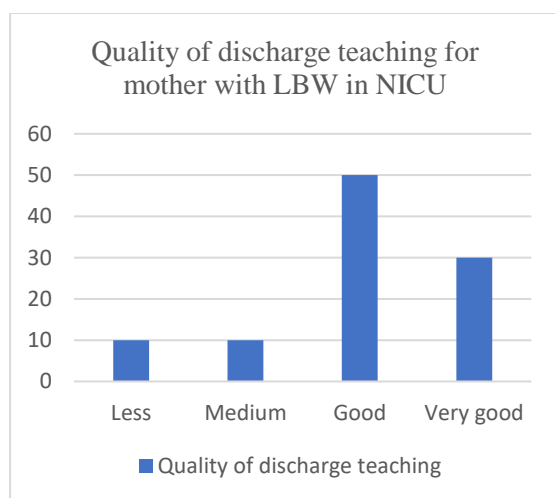


Figure 2. Overview of respondents based on the quality of discharge teaching

In the subscale of content received, most respondents showed high scores especially on the item of child care at home with a mean score of 9.6 and also on the item of child medical needs at home with a mean score of 8.4. The high scores on these two items indicate that LBW mothers felt that they received sufficient and adequate information about infant care at home, including their medical needs such as the use of medicines, wound care, use of medical equipment, signs and symptoms that need to be considered, and control schedules.

In contrast, on the quality of teaching delivery subscale, most respondents showed lower scores, especially on items related to

nurses' communication strategies, with a mean score of 6.7. Specific items in the nurses' communication strategy that received low scores, such as "nurses divide the education delivery into small parts" and "nurses provide opportunities for parents to ask questions," indicate that nurses need to improve their ability to organize information into more digestible parts and provide more opportunities for parents to ask questions and discuss, thus creating effective two-way communication. The importance of the skills that nurses use to teach parents. While materials are important, without high-quality teaching skills, teaching is less effective in preparing parents for discharge teaching (Weiss et al., 2017)

This finding is in line with previous research by Weiss et al. (2017) which showed that the quality of teaching delivery, especially the way nurses convey information, has a more significant influence on the perception of patient readiness to go home compared to the amount of content provided. This shows that in addition to providing complete information, nurses also need to have good communication skills to be able to convey information effectively to parents. Effective communication strategies can increase parents' understanding of the baby's condition, increase their confidence in caring for the baby at home, and ultimately increase their readiness to go home (Weiss et al., 2017).

3.3 Discharge readiness in mothers with LBW in the NICU room

Table 3. Overview of respondents based on discharge readiness

Characteristics	Frequency	Percentage%
Less	0	0%
Medium	11	36,7%
Good	19	63,3%
Very good	0	0%
Total	30	100%

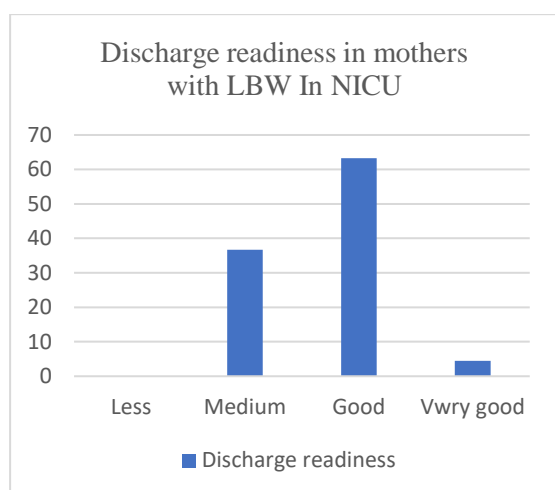


Figure 3. Overview of respondents based on discharge readiness

Table 3 shows the frequency distribution data of respondents based on the level of discharge readiness, showing the majority of respondents had good discharge readiness, as many as 19 respondents (63.3%). Determination of discharge readiness of LBW mothers was carried out by filling out the Readiness for Hospital Discharge Scale-Parent (RHDS-parent) questionnaire. The RHDS-parent score range is 0 to 290. The details of the distribution of discharge teaching quality are as follows: poor (<7), moderate (7-8), good (8-9), and excellent (>9) (Hariati et al., 2020).

Based on the results of the study, a good level of discharge readiness was only found in 63.3% of respondents (n=19). This proportion is significantly lower when compared to a study conducted by Hariati et al., (2020), which showed 90.6% of mothers felt ready to care for their LBW babies after discharge from the NICU. This comparison also highlights the difference with studies in developed countries such as China (90.5%) and the United States (88%) (Chen et al., 2016; Smith et al.,), where the level of maternal readiness to go home from the hospital is also higher.

In the knowledge and coping skills subscale, most respondents recorded high scores, with an average score of 9.7 on items related to knowledge of meeting children's personal needs, and an average score of 9.6 on child care skills items. These high scores reflect that mothers felt sufficiently knowledgeable about LBW care and confident in carrying out their

role as caregivers. These findings suggest that the education provided by health workers during the NICU stay was effective.

In general, the discharge readiness of LBW mothers was good, but the subscales of personal status of parents and expected support showed lower scores, with mean scores of 8.03 and 8.06 respectively. This indicates the challenges that some mothers still feel, particularly related to their physical and emotional condition, and the need for additional support after returning home.

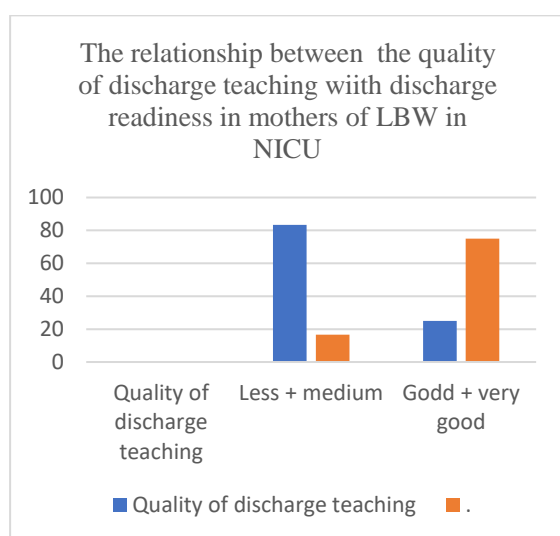
Parent perception of readiness to take their child home from the hospital is an important indicator of potential difficulties they will experience when at home. These feelings of underpreparedness can trigger a difficult transition to the home environment and make it difficult for parents to manage their child's care. Low Readiness for Hospital Discharge Scale (RHDS) scores in parents indicate risk and require anticipatory interventions. These interventions aim to reduce the difficulties that parents may face and increase their ability and confidence to cope with problems that arise.

3.4 The relationship between the quality of discharge teaching with discharge readiness in mothers of low birth weight (LBW) in the NICU

Table 4 presents the correlation analysis between the quality of discharge teaching with discharge readiness in mothers of low birth weight (LBW) in the NICU as many as 30 respondents. The results for the quality of discharge teaching that is lacking and moderate were found to be 5 people (83.3%) with moderate discharge readiness, 1 person (16.7%) with good discharge readiness. Results for good and excellent discharge teaching quality obtained 6 people (25.0%) with moderate discharge readiness, 18 people (75.0%) with good discharge readiness. Based on the correlation test fisher's exact test obtained a significance value (p value) of 0.016 or p value < α (0.05), it can be concluded that H_0 is rejected. This indicates that there is a significant relationship between quality of discharge teaching with discharge readiness in mothers of low birth weight (LBW) in the NICU.

Table 4. Fisher's Exact Correlation Analysis between the quality of discharge teaching with discharge readiness in mothers of low birth weight (LBW) in the NICU

Quality of discharge teaching		Discharge readiness					P value
		Medium		Good		Total-ly	
		n	%	n	%	n	
Less	+	5	83,3	1	16,7	6	0,016
medium							
Good	+	6	25	18	75	24	
very good							
Totally		11	36,7	19	63,3	30	

**Figure 4. The relationship between the quality of discharge teaching with discharge readiness in mothers of LBW in NICU**

The results of this study are in line with previous studies conducted on various patient populations, including general pediatric patients (Weiss et al., 2008), parents of organ transplant patients (Lerret & Weiss, 2011; Lerret et al., 2015), and hysterectomy patients (Guen, 2023). These similar findings indicate that the quality of discharge teaching has a positive correlation with patients' discharge readiness, age or underlying health condition. Research by Weiss et al. (2017) specifically

highlighted the negative impact of low quality discharge teaching on parents' readiness to care for their child at home and face post-discharge challenges. These findings underscore the importance of nurses' skills in providing effective discharge teaching, which focuses not only on the content of the material taught, but also on how to convey the information so that parents feel prepared and confident in caring for their child at home. A study in hysterectomy patients (Guen, 2023) also supports these findings, showing a significant positive correlation between the quality of discharge teaching and the hospital discharge readiness scale ($r = 0.60$, $p < 0.001$).

This study also found differences with the results of Nurhayati's research (2018), which stated that there was no relationship between the quality of discharge teaching and discharge readiness. This difference may be due to variations in research methods, sample size, and the teaching context used. In this study, the role of high-quality and interactive teaching skills seems to be the key to success in improving discharge readiness.

Good quality discharge teaching not only improves mothers' knowledge about LBW care at home, but also increases their confidence in parenting. This can reduce maternal anxiety levels, improve adherence to therapy, and ultimately reduce the risk of readmission (Weiss et al., 2017). The quality of discharge teaching is very important in improving maternal readiness to discharge LBW. Improving the quality of discharge teaching can help mothers feel more confident and capable of caring for their infants at home, thereby improving infant and family health outcomes.

Previous research confirmed that discharge planning, discharge teaching, and empowerment programs significantly contribute to maternal readiness (Chen et al., 2016). Comprehensive discharge teaching and careful discharge planning have been shown to strengthen mothers' readiness to care for LBW infants at home, thereby reducing post-discharge coping difficulties (Weiss et al., 2015). However, in Indonesia, as a developing country, formal guidelines in this regard are still inadequate. Structured discharge education programs for parents of LBW infants are not yet

standard in most hospitals (Hariati et al., 2020). Researchers' observations suggest that limited human resources in the NICU, especially the imbalance between the number of staff and patients, may hinder the optimization of discharge teaching, potentially reducing maternal readiness.

Investing in high-quality discharge teaching is a proactive strategy to improve patient/family and health system outcomes. The effectiveness of nurse teaching influences parents' perception of their readiness, which is an important factor in patient satisfaction and their ability to manage their child's care at home. From a nurse's perspective, parental preparedness correlates with the risk of re-hospitalization, which incurs substantial costs for families and health systems. Parental evaluation of discharge teaching and discharge readiness as standard practice is important for early identification of at-risk families. Formal assessment before discharge can trigger anticipatory services. Several barriers need to be overcome, including often neglected discharge teaching and lack of adequate staffing (Weiss et al., 2017).

Improving the quality of nurse teaching is important to address the issue of inadequate patient preparation. Pre-licensure education, hospital orientation, staff development, and preceptorship programs are important, but often focus on what to teach, not how to teach. In addition to teach-back, other methods need to be explored. Integration of teach-back preparation in staff orientation and unit-based education initiatives is important, but education alone is not enough. Leadership support to monitor teaching performance, modify systems, and evaluate staffing patterns is essential. Improving the quality of teaching before discharge will support hospital and nursing strategic efforts to improve discharge care and outcomes.

CONCLUSION

The characteristics of respondents in this study were the majority of respondents aged 21-35 years (63.5%). The majority of respondents' final education was at the high school / equivalent level, namely 15 respondents (50%). The majority of respondents did not work as

many as 15 respondents (50%). The description of the quality level of discharge teaching for LBW mothers was in the good category, namely 15 respondents (50%). Discharge readiness in LBW mothers was in the good category, namely 19 respondents (63.3%). There is a significant relationship between quality of discharge teaching with discharge readiness in mothers of low birth weight (LBW) in the NICU with a significance value (p value) of 0.016 or p value < α (0.05). Based on these findings, it is recommended that hospitals develop and implement a comprehensive communication training programme for nurses, focusing on teach-back techniques. This training aims to improve nurses' ability to convey information effectively, facilitate discussions with parents, and ensure their understanding. In addition, relevant and easy-to-understand educational materials should be provided by the hospital, such as brochures, videos, or mobile applications that can be accessed by parents. These materials should be designed with simple language, attractive visuals, and up-to-date information.

ADVISE

Future researchers are advised to increase the sample size, expand the population, and use more complex data analysis methods.

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