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REVIEW

Optimal Discharge Education: Evidence for Enhancing Family Preparedness for Premature Infants

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Video abstract

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Objective: The study aimed to systematically search, screen, evaluate, and synthesize evidence regarding the effectiveness of discharge education in enhancing family preparedness for premature infants. The ultimate goal was to provide evidence-based references for implementing discharge education for family caregivers, thereby improving families' discharge readiness and enhancing home care and infant health.

Methods: Systematic searches were conducted across BMJ Best Practice, UpToDate, the Cochrane Library, and other relevant databases from October 2014 to October 2024. The collected literature comprised clinical decisions, guidelines, expert consensuses, systematic reviews, meta-analyses, best practices, and randomized controlled trials related to discharge education for enhancing family preparedness for premature infants. Relevant evaluation tools were selected based on the type of literature to assess methodological quality, and the evidence was extracted, summarized, and organized.

Results: A total of 1724 documents were searched. Ultimately, ten pieces of literature were selected based on the inclusion and exclusion criteria, comprising one clinical decision, one guideline, one expert consensus, two systematic reviews, one meta-analysis, one best practice, and three randomized controlled trials. From these literature, a total of thirty-three pieces of evidence were extracted and synthesized across five domains: assessment, planning, implementation, evaluation, and support.

Conclusion: This study synthesized evidence on discharge education for premature infant' families, revealing key insights for clinical practice. It emphasized tailored education plans, early family involvement, multidisciplinary collaboration, and diverse teaching methods. Implementing these practices is expected to improve families' discharge readiness, thereby promoting better infant health.

Keywords: discharge education, family preparedness, premature infants, evidence synthesis

Introduction

Premature infants, defined as newborns delivered before 37 weeks of gestation, face heightened nursing challenges because of their incomplete physiological development.[1] Due to the immaturity of their physiological systems, these infants frequently encounter challenges such as high risk of infection, difficulties with feeding, and neurodevelopmental concerns. Therefore, they necessitate more meticulous and professional care post-discharge.[2–4] However, in reality, parents of premature infants frequently lack adequate preparedness at discharge, being deficient in essential nursing knowledge and skills to effectively address the various health challenges their infants may encounter at home.[5,6]

Discharge education is a crucial bridge connecting hospitals and families, which is pivotal in enhancing the family's preparedness for premature infants. Research indicates that systematic discharge education can empower parents with skills in daily nursing techniques and knowledge of disease observation and prevention for premature infants.[7,8] This facilitates better care for premature infants within the family setting, reducing rehospitalization rates and alleviating parents' psychological stress, bolstering their confidence in parenting.[9]

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Nonetheless, the current state of discharge education for families of premature infants leaves much to be desired. The absence of standardized discharge preparation protocols results in inconsistent educational content provided by healthcare professionals and different hospitals, failing to meet the practical needs of premature infant families.[10] Inadequate discharge preparedness impacts their caregiving knowledge and abilities, potentially hindering the successful transition of premature infants from the neonatal intensive care unit (NICU) to the home environment, which may ultimately adversely affect the infants' long-term healthy growth.

Consequently, an evidence-synthesis study on discharge education is urgently needed. By systematically reviewing and analyzing existing research findings, we aimed to extract systematic, effective, and practical evidence to inform discharge education practices, thereby providing a strong foundation for developing discharge education programs. This research was essential in enhancing families' discharge preparedness, improving the health outcomes of premature infants, and fostering the standardization of discharge education practices.

Materials and Methods

Study Design and Setting

This study utilized the PIPOST framework to formulate evidence-based inquiries, with the inclusion criteria delineated according to specific parameters. a) Population: The target demographic for the application of evidence was families of premature infants. b) Intervention: The intervention method involved discharge education services to enhance families' readiness for preterm discharge. c) Professional: The professionals responsible for implementing the evidence encompassed nurses and physicians within neonatal departments. d) Outcomes: Pertaining to families' preparation for the discharge and subsequent care of premature infants. e) Setting: The settings for evidence application were neonatal departments in hospitals and associated caregiving institutions. f) Type of evidence: The types of evidence selected for analysis include clinical decisions, guidelines, best practices, expert consensuses, systematic reviews, meta-analyses, and randomized controlled trials (RCTs). Exclusion Criteria: Considering the primary focus of this evidence synthesis on discharge education for enhancing family preparedness for premature infants, any evidence that does not pertain to this central theme was excluded from consideration. This study has been registered with the Evidence-Based Nursing Center of Fudan University (ES20246804).

Evidence Search Strategy

To identify pertinent literature, the search strategy was designed in accordance with the "6S" hierarchy of evidence resources, adhering to a top-down search approach.[11] Systematic electronic searches were executed on various platforms, encompassing BMJ Best Practice, UpToDate, the Cochrane Library. The scope of the search was further broadened to encompass evidence-based resource databases from the Registered Nurses' Association of Ontario (RNAO), the Scottish Intercollegiate Guidelines Network (SIGN), the Global Initiative for Nursing (GIN), the National Institute for Health and Clinical Excellence (NICE), and the Joanna Briggs Institute (JBI). Additional searches were conducted in comprehensive databases, notably PubMed, the American Academy of Pediatrics (AAP), and Web of Science. Moreover, the investigation extended to Chinese databases, including CNKI (China National Knowledge Infrastructure), VIP (Vip Information), and Wanfang Database.

The English search terms encompassed phrases such as "premature/preterm infant/prematurity", "parents/caregivers/family" and "discharge preparation/discharge readiness/discharge teaching/discharge education". The specific English search strategy was as follows: ((((((((((premature[Title/Abstract]) OR (preterm infant[Title/Abstract])) OR (prematurity [Title/Abstract])))) AND (parents[Title/Abstract])) OR (caregivers[Title/Abstract])) OR (family[Title/Abstract])) AND (discharge preparation[Title/Abstract])) OR (discharge teaching[Title/Abstract])) OR (discharge readiness[Title/Abstract])) OR (discharge education[Title/Abstract]). Correspondingly, the Chinese search utilized semantically aligned keywords with the English search terms.

The search period was set from October 2014 to October 2024. The flowchart of literature screening is shown in Figure 1.

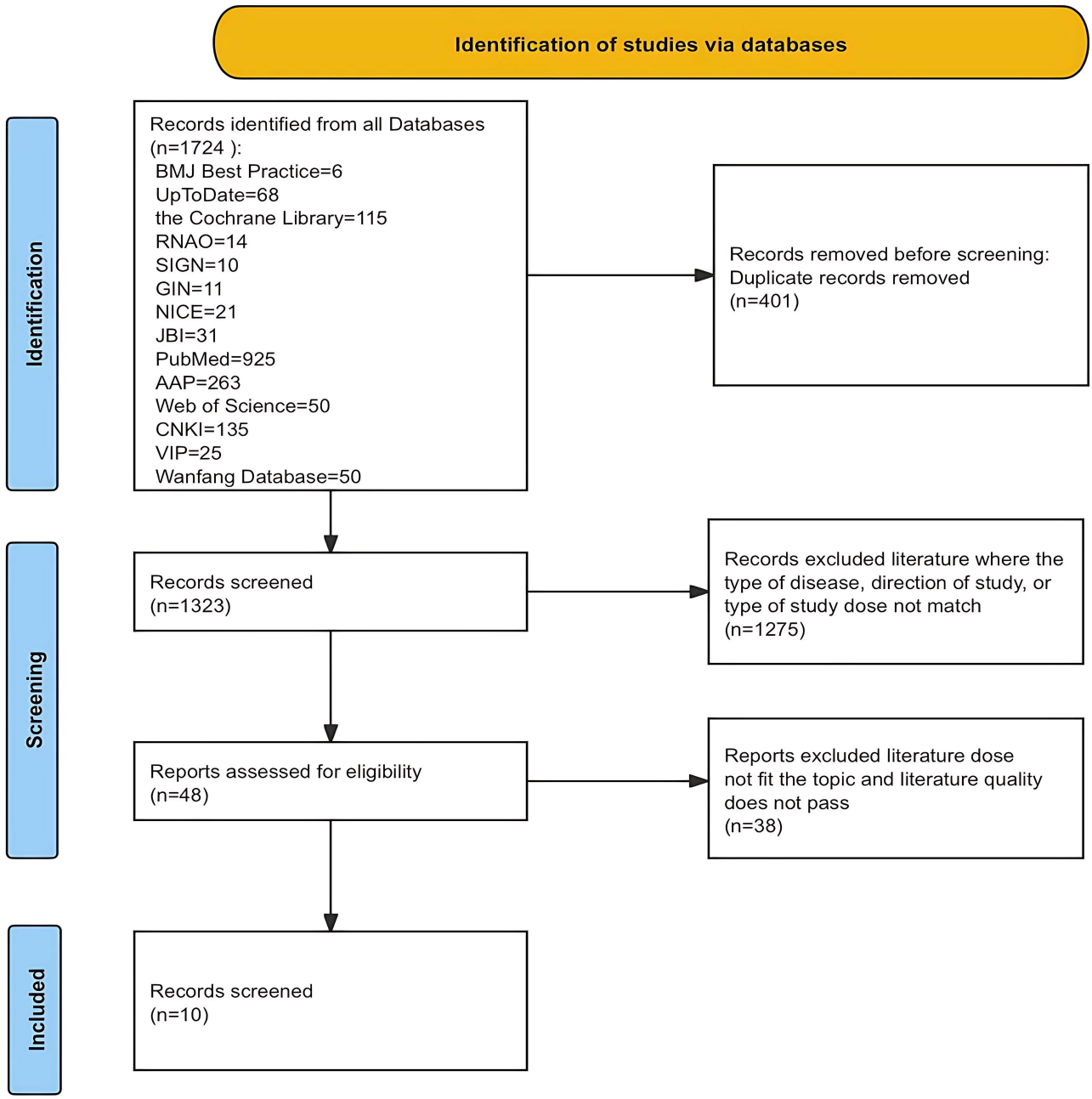

Figure 1 The flowchart of literature screening.

Quality Assessment of Evidence

The research team conducted a meticulous assessment of the evidence quality, carefully selecting evaluation instruments that were specifically tailored to the distinct formats of the presented evidence. The quality of clinical decision was evaluated using the Critical Appraisal for Summaries of Evidence (CASE) tool.[12] The Appraisal of Guidelines for Research and Evaluation II (AGREE II)[13] was employed for the appraisal of guidelines. Both expert consensuses and best practices were assessed using the evaluation criteria for opinion and consensus statements developed by the JBI Evidence-Based Healthcare Center in Australia.[25,] The included systematic reviews and meta-analyses were evaluated using JBI's quality assessment tool for systematic review literature.[26] RCTs were assessed for quality using JBI's RCT evaluation tool.[26] Any discrepancies that emerged among the evaluators were resolved through deliberative consultation with a third experienced team member, leading to a unanimous conclusion.

Evidence Extraction, Summarization, and Grading

The literature was rigorously reviewed post-screening, with evidence extracted and summarized independently by two researchers. Disagreements were resolved through discussion with a third researcher. All involved personnel were trained in evidence-based nursing methodology. The evidence-based team comprehensively summarized the evidence based on the following principles: (I) For consistent content, preference was given to more comprehensible sentences; (II) Multiple complementary sources were integrated into single pieces of evidence; (III) In case of conflicting conclusions from different sources, priority was given to evidence-based on quality, credibility, and the most recent authoritative publications. Evidence was graded using the '2014 JBI Evidence Hierarchy and Recommendation Levels'.[14] For the included clinical decision, guideline, expert consensus, systematic reviews, meta-analysis, and best practice the original sources were traced back for classification.

Results

Results of Literature Screening

In this study, a total of 1724 documents were searched. Ten documents were ultimately included after removing duplicates and conducting a thorough review of titles, abstracts, and full texts. The evidence screening process is shown in Figure 1.

General Characteristics of the Included Literature

The selected literature comprised of one clinical decision,[15] one guideline,[16] one expert consensus,[17] two systematic reviews,[18,19] one meta-analysis,[20] one best practice,[21] and three randomized controlled trials.[22–24] Table 1 presents an overview of the essential characteristics of the included literature.

Table 1 Characteristics of the Included Studies (n=10)

Author	Publication Time	Evidence Type	Literature Theme/Content	Literature Source
Smith VC et al[15]	2023	Clinical decision	Discharge planning for high-risk newborns	UpToDate
Ledinger D et al[16]	2022	Guideline	WHO recommendations for care of the preterm or low-birth-weight infant	BMJ best practice
CMA Pediatric Neonatology Subspecialty Group[17]	2022	Expert consensus	Consensus of Experts on the Management of Premature Infants During the Peri-Discharge Period	CNKI
Pladys P et al[18]	2019	Systematic review	French neonatal society position paper stresses the importance of an early family-centered approach to discharging preterm infants from hospital	Web of science
Kermani F et ali[19]	2023	Systematic review	Outcome's Classification in Mobile Applications Tailored to Parents of Premature Infants	PubMed
Maleki M et al[20]	2022	Meta-analysis	Nurses' strategies to provide emotional and practical support to the mothers of preterm infants in the neonatal intensive care unit	PubMed
Cheng L et al[21]	2016	Best practice	Families' readiness for discharge of their pre-term infant	PubMed
Tiryaki Ö et al[22]	2024	RCT	The effect of family integrated care on preparing parents with premature infants hospitalized in the neonatal intensive care unit for discharge	PubMed
Huang L et al[23]	2023	RCT	Effects of an online family-focused parenting support intervention on preterm infants' physical development and parents' sense of competence and care ability	PubMed
Zhang Ret al[24]	2018	RCT	Evaluated the impact of family-centered nursing intervention on clinical outcomes of premature infants, parental mental health and neonatal nursing skills in Chinese neonatal intensive care units	PubMed

Abbreviations: CNKI, China National Knowledge Infrastructure; CMA, Chinese Medical Association; RCT, Randomized Controlled Trial.

Quality Evaluation Results of the Included Studies

Quality Evaluation Results of the Clinical Decision

The CASE worksheet assessed the quality of the included clinical decision.[15] The evaluation results for items 4 and 5 were "Not completely" while the remaining items were all rated as "Yes" The overall quality of this clinical decision was deemed moderate, and it was approved for inclusion. Details are provided in Table 2.

Quality Evaluation Results of the Guideline

This study included one guideline.[16] Detailed evaluation results and recommendation levels for various domains of the guideline are shown in Table 3.

Quality Evaluation Results of the Expert Consensus and Best Practice

One expert consensus[17] and one best practice[21] were included. The overall quality is high, allowing inclusion. For details, refer to Table 4.

Quality Evaluation Results of the Systematic Reviews and Meta-Analysis

Two systematic reviews[18,19] and one meta-analysis[20] were included. They demonstrated high quality in multiple aspects and were all included. Details are provided in Table 5.

Quality Evaluation Results of the Randomized Controlled Trials

The present study has incorporated three randomized controlled trials,[22–24] and the results of their quality assessments are presented in Table 6.

Summary of Evidence

This study, through a systematic search, screening, and evaluation of relevant literature, has identified 33 key pieces of evidence that collectively shed light on critical aspects of discharge education across five themes: assessment, planning,

Table 2 Quality Evaluation Results of the Clinical Decision (n=1)

Evaluation Items	Evaluation Results
	Smith VC et al[15]
1. Is the source of the viewpoint clearly indicated?	Yes
2. Is the authorship of the summary transparent?	Yes
3. Are the reviewer(s)/editor(s)of the summary transparent?	Yes
4. Are the search methods transparent and comprehensive?	Not completely
5. Is the evidence grading system transparent and translatable?	Not completely
6. Are the recommendations clear?	Yes
7. Are the recommendations appropriately cited?	Yes
8. Are the recommendations current?	Yes
9. Is the summary unbiased?	Yes
10. Can this summary be applied to your patient(s)?	Yes

Table 3 Quality Evaluation Results of the Guideline (n=1)

Included Articles	Standardized Scores in Various Domains (%)						≥60% Field Number (n)	≥30% Field Number (n)	Recommendation Level
	Scope and Purpose	Stakeholder Involvement	Rigor of Development	Clarity of Presentation	Applicability	Editorial Independence			
Ledinger D et al[16]	100%	83.33%	100%	100%	93.75%	62.5%	6	6	A

Notes: Recommendation level: A, the score for each domain is ≥60%; B, ≥3 domains have scores ≥30% and at least one <60%.

Table 4 Quality Evaluation Results of the Expert Consensus and Best Practice (n=2)

Evaluation Items	Evaluation Results	
	CMA Pediatric Neonatology Subspecialty Group[17]	Cheng L et al[21]
1. Is the source of the viewpoint clearly indicated?	Yes	Yes
1. Does the viewpoint come from influential experts in the field?	Yes	Yes
1. Are the interests of the relevant population the central focus of the opinion?	Yes	Yes
1. Does the opinion demonstrate a logically defended argument to support the conclusions drawn?	Yes	Yes
1. Is there reference to the extant literature?	Yes	Yes
1. Is there any inconsistency between the proposed viewpoint and previous literature?	NO	NO

Table 5 Quality Evaluation Results of Systematic Reviews and Meta-Analysis (n=3)

Included Articles	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Pladys P et al[18]	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	NO	Yes	Yes
Kermani F et ali[19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO	Yes	Yes
Maleki M et al[20]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: (I) Evidence-based questions clear? (II) Appropriate literature inclusion criteria? (III) A proper search strategy? (IV) The proper source for a research paper? (V) Criteria for evaluating the quality of literature? (VI) ≥2 evaluators to evaluate the quality of the literature? (VII) Extract information using relevant measures to reduce errors? (VIII) Is the methodology of the synthesis study appropriate? (IX) Assessment of publication bias? (X) Recommendations for policy practice? (XI) Make appropriate recommendations for future research?

Table 6 Quality Evaluation Results of the Randomized Controlled Trials (n=3)

Included Articles	I	II	III	IV	V	VI	VII	VIII	IX	X
Tiryaki Ö et al[22]	Yes	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes
Huang L et al[23]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zhang R et al[24]	Yes	NO	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes

Notes: (I) Implementation of random allocation methods; (II) application of blinding to study participants; (III) execution of allocation concealment; (IV) handling of participants with missing data; (V) blinding of outcome assessors; (VI) baseline comparability; (VII) consistency of intervention implementation; (VIII) consistency of measurement methods; (IX) reliability of the measurement personnel; (X) appropriateness of data analysis methods.

implementation, evaluation, and support. In the assessment phase, the evidence underscores the importance of promptly identifying and engaging the primary caregiver, as well as assessing the unique needs of diverse families, to tailor education effectively. For the planning phase, forming a multidisciplinary team and developing an individualized education plan are key steps to ensure family caregivers systematically acquire the necessary knowledge and skills. During the implementation phase, the early involvement of family caregivers and the utilization of diverse teaching methods are crucial factors that facilitate their proficiency in performing caregiving tasks. In the evaluation phase, systematic evaluation and feedback mechanisms are essential to ensure the effectiveness of the education provided. Lastly, in terms of support, providing practical educational materials and online platforms reinforces family caregivers' nursing abilities and boosts their confidence. Tables 7 and 8 detail the primary evidence and their respective sources identified in this study.

Table 7 The Best Evidence Content and Rating for Discharge Education to Enhance Family Preparedness for Premature Infants

Category	Content of the Evidence	Evidence Level
Assessment	1. In the early stage of an infant's hospitalization, it is imperative to promptly assess and identify the primary caregiver who will provide subsequent care post-discharge, and ensure the involvement of at least one other family member in the infant's care.[15,18,21]	3c
	2. It is essential to assess and identify the specific needs of diverse families, including those with military personnel, language barriers, disabled caregivers, and varying cultural backgrounds, and to provide appropriate and anticipated forms of support, with particular attention to the economic, social, linguistic, and cultural characteristics of each family.[15,18]	1d
	3. The training needs of family caregivers for premature infants should be assessed.[17]	5b
	4. Assess the family environment of the caregiver and the resources available for infant care.[21]	5a
	5. Assess the family caregiver's nursing ability, psychosocial readiness, learning needs, and preferred learning style.[20,21]	1b
Planning	6. Form a multidisciplinary team for discharge education planning and implementation, comprising the core neonatal management team (including the neonatal unit lead, head nurse/specialized nurse, and primary neonatologist) and other professionals involved in the treatment, care, and rehabilitation of premature infants (such as respiratory therapists, dietitians, feeding specialists, pharmacists, case managers, social workers, etc). Additionally, the primary family caregiver of the premature infant should participate whenever possible.[15,17]	5b
	7. An individualized and structured educational plan should be developed to ensure that family caregivers systematically acquire and master the skills, knowledge, and judgment necessary for caring for infants at home.[15,18,20,21]	1b
	8. Some infants have complex and/or additional medical needs after discharge. It is important to consider these needs and to have a discharge education plan that allows for complex, flexible, ongoing care.[15]	5b
	9. Content needs to be consistent and provide the family caregivers with an overview of the information and skills they are expected to be confident in prior to NICU discharge, which will be helpful after discharge.[15]	5b
	10. The education program should offer support, repetition, frequent opportunities to evaluate progress, and the capacity for adjustment as necessary.[15]	5b
	11. The detailed planning for family caregivers education content is shown in Table 8.[15,16,18,21]	5b
	12. The aim is to enable the family caregivers to take part in their child's care and become increasingly independent during hospitalization by learning to observe and understand their child's reactions and gain confidence in their own abilities.[18]	1d
Implementation	13. Involve family caregivers early upon admission, progressively increase their involvement, and maintain their engagement throughout the entire hospitalization process.[15,16,18,21]	5a
	14. Multiple educational and training approaches, including mother-infant rooming-in, parental classes, individualized training, online micro-lectures, discharge educational manuals, peer support, and applications and mini-programs with various educational modules, are employed to ensure family caregivers' proficiency in nursing skills.[15,17,20]	2d
	15. Involve family caregivers in the NICU rounds and routine care of infants in the days prior to discharge.[15,16]	5b
	16. The family-focused support model can effectively assist caregivers in preparing for an infant's discharge and subsequent early transition to home. The integration of online support demonstrates strong acceptance and feasibility in practical application.[22–24]	1c
	17. Avoid exaggerating the vulnerability and risks of premature infants, in order to prevent overly protective measures that may limit their developmental and social progress.[17]	5b
	18. Utilize a care content checklist to ensure family caregivers receive comprehensive guidance.[15,17]	5b
	19. Conduct a thorough and organized review of the hospitalization process with the NICU team to assist family caregivers in better understanding the infant's hospital stay.[15,18]	1b
	20. The medical team should collaborate with family caregivers to assess and determine the discharge date.[18]	4c

(*Continued*)

Table 7 (Continued).

Category	Content of the Evidence	Evidence Level
Evaluation	21. Establish an educational feedback mechanism to assess the family caregiver's caring abilities using a checklist during each visit and adjust the educational content based on the assessment results.[18,20,21]	2c
	22. It is necessary to focus on and evaluate the enhancement of the abilities of premature infant family caregivers after training, including their basic knowledge, skills, and attitudes towards home care, the level of family support they receive, their proficiency in feeding skills, parent-child relationship and responsive care, first aid capabilities, safety precaution abilities, as well as their psychological state.[15,17]	2c
	23. It is necessary to assess the Home Nurturing Environment. Evaluating the spatial arrangement, lighting, noise levels, temperature, humidity, and overall hygiene conditions, the safety of the premature infant's crib, and the material, softness, and size of crib items.[15,17]	1c
	24. It is necessary to assess the feasibility and safety of home therapy. Reviewing the readiness of therapeutic equipment, including the functionality of oxygen generators, humidifiers, monitors, ventilators, and nebulizers, with in-hospital testing. Evaluating the caregiving capabilities of parents of premature infants who require tube feeding, have intestinal fistulas, or have undergone tracheostomy upon discharge. Guiding safe home oxygen use, including the environment for oxygen administration, adjustment of oxygen concentration, target pulse oxygen saturation ranges and appropriate alarm settings, methods for gradual oxygen weaning, and measures for nasal skin and mucous membrane protection, as well as equipment cleaning and disinfection during oxygen use.[17]	5b
	25. Assess educational effectiveness through a combination of family caregiver self-evaluation and nurse assessment to ensure education quality.[17]	5b
	26. Assess family caregivers' mastery of previous training content based on the individual circumstances of premature infants and identify their needs for further training.[21]	4c
Support	27. Educational materials like brochures and posters should be developed based on the best available evidence and current practical situations.[21]	2c
	28. Written material that is presented in a manner that is simple, clear, and devoid of medical jargon, with complex words and concepts defined in precise terms.[15]	5b
	29. An education room equipped with necessary teaching facilities and ensuring family privacy should be established within the department.[21]	2c
	30. An online support platform, such as a WeChat group, can be established to provide ongoing support and information to families.[21]	2c
	31. Images, visual aids, multimedia, and audio recordings can be utilized to enhance educational effectiveness.[15]	5b
	32. Some families benefit from supplemental educational materials that they can review at their own pace on a smartphone or other device.[15]	5b
	33. Mobile applications can be helpful in prematurity for educating mothers, managing stress and anxiety, supporting families, and preparing for discharge. The development of tailored apps can promote the neonates' health and reduce family caregiver's stress.[19]	2b

Discussion

Discharge preparation services, originating from the continuous care and referral system in the United States, represent a novel care model that has emerged in recent years. They play a crucial role in ensuring patient safety upon discharge and the sustainability of home-based rehabilitation care and have become a focal point of attention among international nursing scholars.[27] Discharge education is a key aspect of discharge preparation and sets the stage for a successful transition.[28] This study provides a comprehensive summary of the optimal discharge education practices to enhance family preparedness for the care of premature infants. Through a systematic review and analysis of existing research findings, we have distilled key, evidence-based recommendations that encompass assessment, planning, implementation, evaluation, and support.

Assessment for Discharge Education

Evidence 1–5 summarizes the content that should be assessed before conducting education on discharge preparation for family caregivers of premature infants. Evidence 1 suggests that during the initial hospitalization of the infant, it is

Table 8 The Detailed Planning for Family Caregiver's Education Content

Category	Subcategory	Detailed Description
Family Environment Preparation and Safety	Family Environment Preparation	List of necessary parenting supplies to help parents prepare in advance.
		Maintain household hygiene and appropriate temperature and humidity.
		Avoid crowd gatherings to reduce infection risk.
		Hand hygiene timing and methods.
	Safety Practices	Provide safe sleep guidance, including management of sleep position and environment to prevent Sudden Infant Death Syndrome (SIDS).
		Instruct on the proper use of car safety seats, including placement and positioning of infants.
Daily Care and health Monitoring	Feeding Support	Breastfeeding guidance, including how to pump and store breast milk, and the use and precautions of breast milk fortifiers.
		Formula feeding guidance, including types of formula, mixing methods, and observation of feeding tolerance.
		Educate family caregivers to recognize feeding-related abnormalities, such as vomiting, abdominal distension, and abnormal stool characteristics.
		Guidance and practice for nasogastric or gastrostomy feeding.
	Daily Care Skills	Methods for warming, bathing, dressing, kangaroo mother care, and touching.
		Head shape correction and maintenance, wrapping methods to protect normal hip development.
	Observation of Health Status	Focus on weight, length, and head circumference, and understand how to obtain and use growth curves.
		Observation methods for visual and auditory development.
		Normal manifestations of breathing, skin color, skin temperature, feeding status, and abdominal condition.
		Monitoring of limb movement, reactivity, urination, and defecation.
	Abnormality Identification and Handling	Identifying abnormalities such as vomiting, choking on milk and aspiration, cough, respiratory abnormalities, and apnea.
		Observation of abnormalities such as fever or hypothermia, bloating, abnormal bowel movements, umbilical abnormalities, skin abnormalities, and convulsions.
		First aid skills training, including infant CPR and Heimlich maneuver training.
Nursing for Complex Medical Needs	Medical Equipment	Ensure medical supplies are in place for infants with special medical needs, such as home oxygen therapy, respiratory support, cardiopulmonary monitoring, pulse oximetry, tube feeding, nebulization inhalation, etc, and provide sufficient usage guidance.
	Supplies	Ensure special medications, special formula foods, and/or dietary supplements are available and provide sufficient usage guidance.

(*Continued*)

Table 8 (Continued).

Category	Subcategory	Detailed Description
Disease Screening and Vaccination	Routine discharge screening	The following routine screenings should be completed prior to discharge: metabolic and genetic disease screening, retinopathy of prematurity (ROP) screening, hearing screening, and brain imaging, with subsequent follow-up measures ensured.
	Vaccination	Clarify the completed and incomplete vaccination items, ensure that relevant vaccination information is communicated to the parents or guardians of premature infants, and provide guidance on the pathway for special premature infants to complete subsequent vaccinations.
Expectations Guidance	Follow-up Plan for Premature Infants	Inform family caregivers of the primary care and specialist follow-up plan to monitor premature infants' nutrition, growth, and neurodevelopment.
	Emotion Management	To guide family caregivers in adopting strategies for managing stress, anxiety, and depression.
	Parent-Child Relationship	To guide parents in adopting measures to promote parent-child relationship.
	Expected Situation After Discharge	The NICU team should provide realistic life expectations to caregivers, including short- and long-term post-discharge medical appointments, infant growth and development issues, and possible mental health challenges for caregivers (such as anxiety and/or depression), and encourage them to seek help.
	Interaction with Other Children in the Family (if necessary)	Communicate the premature infant's condition to their siblings to make them understand how to protect the premature infant.

crucial to promptly assess and identify the primary caregiver who will provide subsequent care after discharge and to actively involve at least one other family member in the infant's care. This plays a pivotal role in ensuring effective post-discharge care. Evidence 2 emphasizes that recognizing the unique needs of diverse families, such as those with military personnel or language barriers, facilitates the provision of tailored support that accommodates economic, social, linguistic, and cultural differences. This approach acknowledges that effective discharge education must be culturally sensitive and adaptable Evidence 3–5 highlights that assessing the training needs of family caregivers for premature infants is essential to ensure they are adequately prepared to provide appropriate care. This assessment should be comprehensive, encompassing technical skills related to infant care and emotional and psychological support for the caregivers themselves. By understanding the specific challenges each family faces, healthcare providers can better equip family caregivers with the knowledge they need to navigate the complexities of caring for a premature infant.

Planning for Discharge Education

The evidence from 6 to 12 summarizes key recommendations for discharge education plans for family caregivers of premature infants. Evidence 6 emphasizes forming a multidisciplinary team comprising the core neonatal team and other professionals involved in treatment, nursing, and rehabilitation while also striving to involve primary family caregivers whenever possible. Evidence 7 to 10 advocates for a personalized, structured educational plan to ensure family caregivers systematically learn necessary skills. Given that some premature infants have complex or additional medical needs, the educational plan should be flexible to support continuous care. The education content needs to be consistent to avoid confusing family caregivers. It should also provide opportunities for repeated practice, progress assessments, and necessary adjustments. This iterative process reinforces learning and allows for identifying and resolving any gaps or misunderstandings in the caregivers' knowledge or skills. Evidence 11 details educational content planning to empower family caregivers during hospitalization. Evidence 12 clarifies that the goal is to adequately prepare family caregivers for home care, promoting positive outcomes for infants and families. These recommendations aim to enhance family caregivers' confidence and abilities, ensuring they are well-prepared to manage their infant's care at home. By adopting

a comprehensive and individualized approach to discharge education, healthcare providers can empower family caregivers to provide the best possible care for their premature infants, ultimately leading to improved health outcomes and a smoother transition from hospital to home.

Implementation of Discharge Education

In the implementation phase of discharge education, Evidence 13–20 collectively suggests operational recommendations. Some parents mentioned that the short notice before discharge resulted in hurried and inadequate preparation for discharge.[29] Evidence 13 recommends early engagement of family caregivers upon premature infant admission, with a gradual introduction of educational content to ensure adequate time for acquiring essential knowledge and skills. Evidence 14 proposes adopting diverse teaching methods, encompassing mother-infant rooming-in, parental education classes, individualized training, online micro-lectures, discharge manuals, peer support, and educational apps/mini-programs, to guarantee family caregivers' proficiency in caregiving tasks. Internationally, bedside teaching is one of the most effective ways of teaching. Bedside teaching involves demonstrating to the family how to perform a task, assessing their understanding, and having them perform the task.[30] Evidence 15 suggests involving family caregivers in the infant's rounds and routine care within healthcare facilities pre-discharge, facilitating a smooth transition to home care. Evidence 16 advocates for a family-centered support model enhanced by online resources, demonstrating adaptability and efficacy. Evidence 17 emphasizes the importance of avoiding exaggerating premature infants' vulnerability and risks to prevent overly protective measures that could impede their developmental and social milestones. Evidence 18–20 recommends utilizing a care content checklist to ensure comprehensive guidance. Family caregivers engage in collaborative reviews of the infant's hospital stay and conduct joint assessments with the healthcare team to determine the discharge date, thereby fostering an understanding of the hospitalization process and facilitating informed decision-making regarding discharge.

Evaluation for Discharge Education

The evaluation and feedback of the educational process are vital for ensuring its effectiveness. Evidence 21 suggests that by employing a checklist during each visit, family caregivers' abilities can be systematically assessed, allowing for tailored adjustments to the educational content. This approach ensures individualized training for family caregivers, enhancing their proficiency in various aspects of premature infant care. Evidence 22–24 recommends a comprehensive evaluation of family caregivers' skill enhancement, the home nurturing environment, and the feasibility and safety of home-based treatment during discharge education. This ensures a smooth transition for premature infants to the home environment and proper care and treatment. Evidence 25 mentions that integrating family caregivers' self-assessment with nurse evaluation offers a multi-dimensional perspective on the effectiveness of the education. Evidence 26 further suggests assessing family caregivers' needs for further training based on previous evaluations. These appraisals enable personalized adjustments to discharge education, confirming caregivers' discharge readiness and the suitability and safety of the home nurturing environment, thereby providing a solid foundation for the smooth transition of premature infants from hospital to home.

Support for Discharge Education

Practical educational support forms the cornerstone of the overall educational process. Evidence 27–28 suggests that educational materials such as brochures and posters can be developed based on the best available evidence and current practical situations to ensure families receive accurate and practical information. These materials should be presented concisely and clearly, avoiding medical jargon and providing precise definitions for complex terms and concepts. Evidence 29–32 indicates that some families can benefit from supplementary educational materials, allowing them to review on smartphones or other devices at their own pace. Mobile applications can be beneficial in prematurity for educating family caregivers. Establishing online support platforms, such as WeChat groups, can facilitate continuous information dissemination and support to families. Using images, visual aids, multimedia, and audio recordings can significantly enhance the effectiveness of education. Evidence 33 recommends setting up an education room within the department, equipped with necessary teaching facilities, to protect family privacy. The Integrated theory of health behavior change highlights instrumental support as a key facilitator of health behaviors, and these evidence provide valuable guidance for the refinement/development of support tools.[31]

The evidence presented encompasses 33 key recommendations for optimal discharge education practices to enhance family caregivers' preparedness to care for premature infants. These recommendations span assessment, planning, implementation, evaluation, and support, underscoring the significance of a holistic and personalized approach. They emphasize the importance of identifying primary caregivers early, assessing their unique needs, and developing tailored, structured educational plans. Implementing these plans through diverse teaching methods is crucial, highlighting the need for a multidisciplinary team approach and early engagement of family caregivers. Furthermore, the evidence stresses the importance of consistent and flexible educational content, regular evaluation and feedback, and effective educational support, including evidence-based materials and online platforms. These elements are essential to ensure high-quality care for premature infants and their families as they transition from hospital to home.

Limitations

This study included ten documents, which may limit the comprehensiveness of the evidence. Therefore, the conclusions drawn should be interpreted cautiously and may require further validation through more extensive and diverse studies.

Conclusion

This study systematically synthesized evidence regarding the effectiveness of discharge education for premature infants' families. The findings revealed several key insights that form a comprehensive framework for clinical practice. The study highlighted the importance of tailored, individualized discharge education plans that address the unique needs of each family. The early involvement of families, multidisciplinary team collaboration, and the use of diverse teaching methods are crucial for helping families acquire necessary nursing knowledge and skills. Implementing these evidence-based practices is expected to significantly improve families' discharge readiness, enhance their ability to care for their premature infants, and ultimately promote better infant health outcomes.

Abbreviations

PIPOST, Population, intervention, professional, outcome, setting, type of evidence; RNAO, the Registered Nurses' Association of Ontario; SIGN, the Scottish Intercollegiate Guidelines Network; GIN, the Global Initiative for Nursing; NICE, National Institute for Health and Care Excellence; JBI, Joanna Briggs Institute; AAP, the American Academy of Pediatrics; CNKI, China National Knowledge Infrastructure; VIP, Vip Information; CASE, the Critical Appraisal for Summaries of Evidence; AGREE II, The Appraisal of Guidelines for Research and Evaluation II.

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Disclosure

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