

Effectiveness of relevant interventions with readiness for discharge in transitional care of low birth weight infants: a systematic review



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ABSTRACT

Introduction: Readiness for the discharge process to caring for low birth weight (LBW) is a top priority in providing quality nursing services in the perinatology room. The process of readiness for discharge is considered successful if the LBW is safe and comfortable during discharge. This study aimed to identify interventions relevant to readiness for discharge to improve transitional care for LBW and to assess the quality of available evidence using a systematic scientific approach.

Methods: Following the PRISMA checklist, a systematic review of randomized controlled trials and quasi-experimental studies was identified in eight electronic databases published from 2015 to 2022. All articles were discovered using the PICO framework and assessed using the Critical Appraisal Skills Program (CASP) tool. All articles were analyzed and synthesized narratively.

Results: A total of 201 titles were identified, and 25 studies met the inclusion criteria involving 3158 parents. Ten studies were RCT studies, and fifteen were quasi-experimental studies. The results of the narrative synthesis carried out on twenty-five articles showed that interventions relevant to readiness for discharge were effective in improving the transition care for LBW, including the transition to parenthood and the transition from hospital to home related to the ability to care for LBW.

Conclusion: This study provides evidence that nurses can modify and effectively carry out interventions relevant to discharge readiness to improve the transition care for LBW. Perinatology nurses must actively involve families in supporting mothers in optimal readiness for discharge.

Keywords: low birth weight, premature, readiness for discharge, transitional care.

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INTRODUCTION

The transition from hospital to home care can pose challenges for parents without experience caring for their infants.¹ Transitional care from hospital to home is very important for parents responsible for caring for their babies.² This is when things can go wrong if parents don't have the knowledge and skills to care for infants at home. Although discharge education has been provided in many hospitals, no standard measure is currently used in pediatric transitional care settings, especially in low birth weight (LBW) infants.³ This condition triggers most parents to show they are still less prepared to go home.⁴ As a result, parents often feel unprepared and lack confidence in adapting to their new role as primary caregivers in caring for LBW.⁵ Research

shows that the mother's lack of readiness to go home is associated with poor parent-child bonding and poor coping skills where, which can have an impact on the mother's inability to carry out transitional care for LBW at home, which in turn can inhibit the development and growth of the baby to the use of natural resources. Higher post-acute health care power.⁶ Therefore, integrated management of health professionals in preparing for patient discharge is needed to improve care for the LBW transition.³

Readiness to discharge from the hospital has been described as a multidimensional concept that represents physical, psychological, and social conditions in understanding the ability of patients and families to leave an acute care facility. Discharge readiness is an important predictor of a successful transition from

hospital to home-based care.⁷ Improving parental discharge readiness for home transition has a potentially positive effect on parents' physical and emotional health as well as the health of LBW.^{8,9} Nurses are important in facilitating the transition from hospital to home for parents with LBW.¹⁰ Transitional care is carried out by preparing for the return of parents by nurses starting from the time the baby is cared for in the infant care room. Nurses, especially mothers, are very important in preparing to return to the family in increasing their confidence in caring for babies at home.¹¹

Readiness to leave the hospital is a condition and a process. Readiness to leave the hospital includes 3 discharge planning processes: assessment and planning for discharge needs, exchange of information, and coordination between various

disciplines with patients and families.¹² However, the scope of instruction and intervention recommendations relevant to discharge readiness in transitional care in LBW has not been elucidated.

Transitions are complex multidimensional phenomena or constructions, difficult to explain and define. There is no agreed definition of transition.¹³ Transitions are outcomes and consequences of changes in life, health, relationships, and the environment. Transitional care for parents of LBW after discharge from the hospital is defined as the transition to parenthood and transition from hospital to home related to the ability to care for LBW.¹⁴ Therefore, this study aimed to summarize the evidence identifying the effectiveness of interventions relevant to discharge readiness in improving transitional care in LBW.

METHODS

Article Search

The searching strategies carried out in this systematic review were: 1) determining keywords using Medical Subject Headings (MeSH) following the research topics, namely: discharge readiness, readiness for discharge, discharge preparedness, patient discharge, continuity of patient care, NICU discharge; discharge teaching; 2) search for articles through databases such as Google Scholar, Ebsco, Sage, PubMed,

Science Direct, Pro Quest, Scopus and Ovid to identify relevant articles. The article is limited from the years 2015 to 2022.

Article Selection

The selection of articles in the systematic review referred to the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines to gain insight into the effectiveness of interventions relevant to discharge readiness in LBW transition care. References from articles were rechecked to screen for related studies that were excluded from the initial search to avoid studies with overlapping results.

The eligibility criteria used in the systematic review used the PICO framework (Table 1). The inclusion criteria were: (1) The study focused on families with LBW/Premature; (2) The study examines interventions relevant to discharge readiness and management of LBW/premature care. (3) The study limits the systematic review to a pre-experimental design, randomized control trial. Exclusion criteria were articles with systematic reviews, narrative reviews, scoping reviews, observational study; only available as an abstract; presenting only qualitative data; having duplicate data or overlapping populations. The main purpose of this review is to examine the evidence-based to assess the effectiveness

of interventions relevant to the readiness to return home to care for the transition to LBW, including transition to parenthood and transition from hospital to home related to the ability to care for LBW.

RESULTS

Article Screening and Selection

We found 201 articles in the first identification. Screening and eligibility evaluation are done after the identification. This systematic review identified, assessed, and synthesized 25 articles published to evaluate the effectiveness of interventions relevant to discharge readiness as programs that play an important role in improving transitional care in LBW. The process of article screening and selection is shown in Figure 1.

Data Extraction

Data extraction (Table 2) included the researcher, year of publication, method, intervention and control groups, sample and population, and main findings. The total number of participants ranges between 26-804. Each study has different characteristics, outcomes, and main findings.

Quality Assessment

The analytical quality of eligible articles (Table 3) was assessed independently using the CASP Research articles that

Table 1. PICO Criteria.

	PICO framework	Inclusion Criteria	Exclusion Criteria
P	Population	Studies focus on parents/families with LBW/Premature.	Studies that do not review parents/family and are not associated with LBW/Premature/pediatric.
I	Intervention	The study identified interventions relevant to readiness for discharge and family management of infant/LBW/premature/child care.	Studies that do not discuss the effect of providing intervention on respondents
C	Comparators	-	-
O	Outcomes	Studies that describe interventions that affect the transition to parenthood (self-confidence, adaptive coping, self-efficacy, parenting competence) and the transition from hospital to home related to the ability to care for LBW (feeding behavior, early initiation of breastfeeding, infant's weight, and infant's general well-being)	-
S	Study design and publication type	Quasi-experimental, randomized controlled trial (RCT), Experimental design	a systematic review, narrative review; scoping review, observational study, available only as abstract; presenting only qualitative data

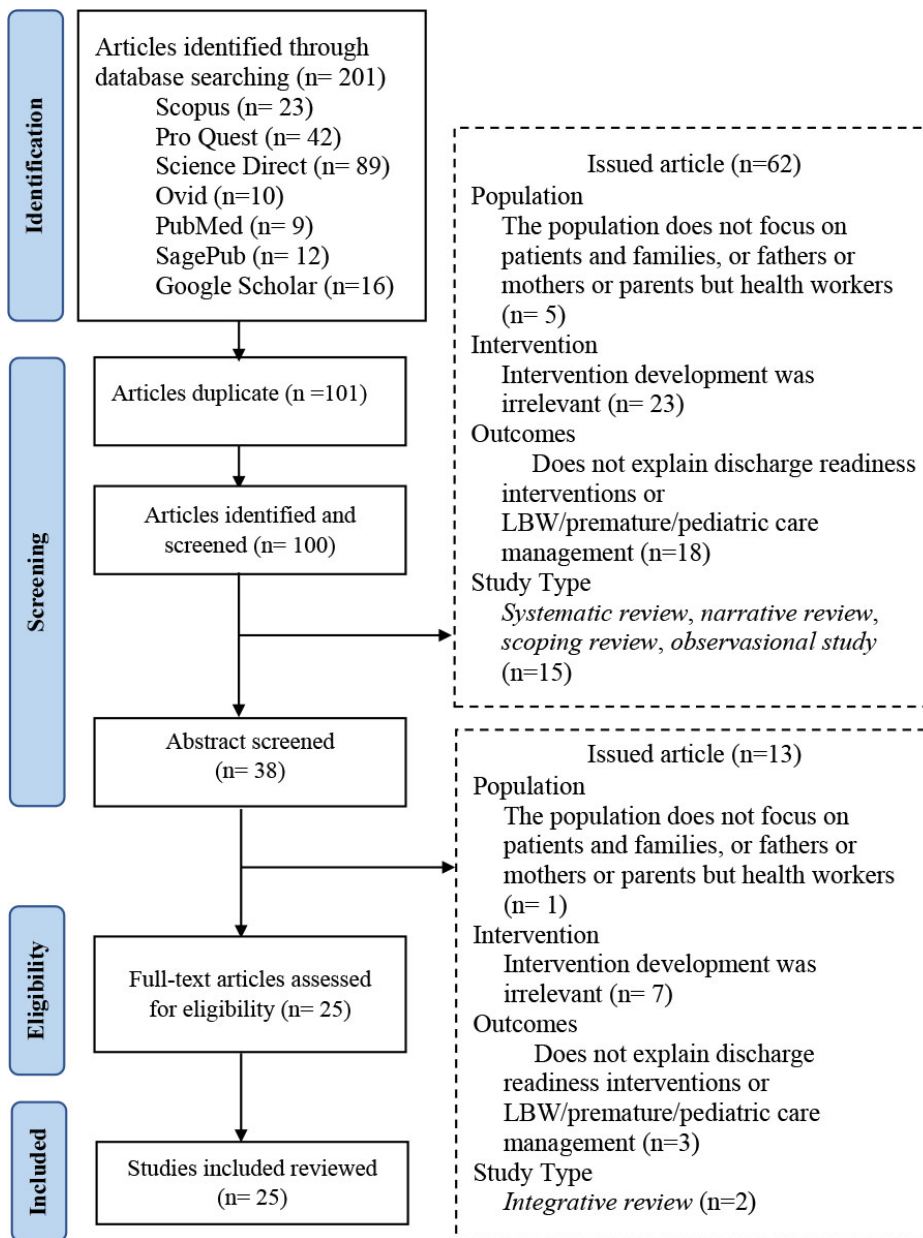


Figure 1. Process of screening and selection of reviewed studies.

met the inclusion criteria and were entered into the bibliography software (Mendeley). Eligible research articles were then assessed and synthesized. The quality of the reviews was good, which was assessed independently by two reviewers using the CASP. The heterogeneity of the dependent variable makes it difficult to attribute specific outcomes to specific interventions, as factors related to intervention strategies, educational materials, implementation methods, and the context in which implementation takes place can influence the outcome of studies in which transitional care is assessed.

DISCUSSION

Several studies have taken the form of training interventions in conjunction with counseling or other interventions to improve self-management outcomes such as conducting infant care and breastfeeding demonstrations to increase confidence in caring for infants and encourage family participation in caring for infants.³⁹ Previous research found that discharge planning, discharge teaching, and empowerment programs were significant interventions for building readiness to return home. Parental empowerment programs can increase the interaction

between parents and children, affecting their emotional relationships. Educational program interventions were observed to have more positive parenting interactions and provide stronger confidence in their ability to care for infants.³⁷ The educational material focuses on general information about LBW, risk factors for LBW, and LBW care. The results in this review align with the research conducted by Pineda et al. (2020) say parents may not adequately identify risk factors early and changes in the development of LBW, which may result in a lack of understanding of LBW care needs.²³

Outcomes in the form of transitional care were assessed, consisting of transition to parenthood and transition from hospital to home related to the ability to care for LBW. The transition to parenthood includes reviews of self-confidence, adaptive coping, self-efficacy, and parenting competence. It was found that there was a statistically significant difference between maternal emotional readiness in the control and experimental groups according to the mother's self-report ($p=0.0001$) and nurse evaluation ($p=0.003$).²² The unpreparedness of parents in the discharge of patients and families causes a different psychological pressure for parents and caregivers of children; feelings of guilt and helplessness can contribute to children's health during the transition period.⁵ Some of the studies included for secondary outcomes are more aimed at empowering and providing support. It suggests such interventions may benefit parental/family self-efficacy and exit preparedness.^{16,40} Other literature also explains that the support intervention carried out by people both verbally and non-verbally reduces the mother's level of anxiety so that calm will be created during the treatment process and can increase the interaction relationship between mother and mother-baby.²¹

The transition from hospital to home related to the ability to care for LBW includes a review of feeding behavior, early initiation of breastfeeding, infant's weight, and infant's general well-being. The results of research conducted by Fontana et al. (2018) said that early intervention programs, including interventions relevant to discharge readiness, can increase

Table 3. Quality assessment of the included studies through the CASP Checklist.

No	Author name	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11
1	Fontana <i>et al.</i> (2018)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	Bos <i>et al.</i> (2018)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Gar <i>et al.</i> (2016)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	Mobbs, Spittle, and Johnston (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5	Moradi <i>et al.</i> (2018)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
6	Lee <i>et al.</i> (2019)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7	Benzies <i>et al.</i> (2020)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Mukarubayiza and Gowan (2019)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
9	Peyrovi <i>et al.</i> (2015)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
10	Pineda <i>et al.</i> (2020)	Y	C	Y	Y	Y	Y	Y	Y	Y	Y	Y
11	Hägi-Pedersen <i>et al.</i> (2017)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
12	Leets <i>et al.</i> (2020)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
13	Ingram <i>et al.</i> (2016)	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y
14	Vohr <i>et al.</i> (2018)	Y	C	Y	Y	C	Y	Y	Y	Y	Y	Y
15	Prabhakaran and Arulappan (2021)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
16	Chen, Zhang, and Bai (2016)	Y	C	Y	Y	C	Y	Y	Y	Y	Y	Y
17	Banerjee <i>et al.</i> (2020)	Y	C	Y	Y	C	Y	Y	Y	Y	Y	Y
18	Hägi-Pedersen <i>et al.</i> (2022)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
19	Ghomi <i>et al.</i> (2019)	Y	C	Y	Y	C	Y	Y	Y	Y	Y	Y
20	Sohrabi <i>et al.</i> (2021)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
21	Alwan and Ma'ala (2021)	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y
22	Khanjari <i>et al.</i> (2021)	Y	C	Y	Y	C	Y	Y	Y	Y	Y	Y
23	Orkin <i>et al.</i> (2021)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
24	Mohammaddoost, Mosayebi, Peyrovi, M. M. Chehrzad, <i>et al.</i> (2016)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
25	Parhiz <i>et al.</i> (2016)	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y

breastfeeding for babies when they leave to maintain initiation and lactation.¹⁵ Another review that was also reviewed was the finding that interventions relevant to readiness to return home could be hampered due to low incomes. Income is one of the predictors of unpreparedness for discharge of patients and families related to welfare and low income can limit access to the care needed by family members.^{41,42}

Low rates of referrals by service providers Just as emergency planning includes assessing the understanding of parents or families in providing appropriate responses (e.g., calling emergency services) in an emergency, lack of family follow-up can result in the underutilization of healthcare facilities.⁴³ Although the intervention period varied across these studies, the skills training intervention effectively improved many components of self-management. Training mothers on how to care for LBW can be useful and effective in adding baby weight

and can shorten the baby's hospitalization period.³⁷

This systematic review has several strengths and limitations. An extensive literature search was conducted, accompanied by a screening of references from relevant reviews and included studies. The limitations in the systematic review during the literature identification, analysis to compilation, and summary process are as follows: 1) This systematic review is empirically limited because it only identifies studies in English; 2) The reviewer only performs a narrative analysis; 3) Heterogeneity in interventions and outcomes reported in included studies limits comparability between studies. Further research must be conducted to explore the readiness to return home to LBW transition care. Future research can recruit parents of premature/LBW infants through systematic referral by healthcare professionals to minimize the effects of confounding and bias. Furthermore,

interventions should offer specific content for the psychological problems of parents of premature/LBW infants in transitioning care from hospital to home.

CONCLUSION

This systematic review highlights the effectiveness of research on the use of interventions relevant to discharge readiness for transitional care in the maternal/father population (families) who are at high risk of having low birth weight so that families can carry out transitional care at home as indicated by an increase in transition to parenthood and transition from home related to the ability to care for LBW. This systematic review emphasizes the need for research on this topic, given its relevance for LBW/premature families.

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CONFLICT OF INTEREST

Regarding publishing this work, the authors state that we have no conflicts of interest.

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ETHICAL CONSIDERATION

Not applicable.

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Table 2. Summary of the included articles.

No	Author name	Method	Participants	Intervention	Outcomes	Main findings
1.	Fontana <i>et al.</i> (2018) ¹⁵	RCT	70 mothers of preterm infants EI:34 SC:36	Early intervention	Feeding behavior	Early intervention techniques, primarily based on parent education packages, had successfully increased breastfeeding of preterm infants on discharge.
2.	Bos <i>et al.</i> (2018) ⁵	Quasi-experimental 1 group pretest/ posttest	42 participants	Neonatal discharge program	a. Parental efficacy b. Psychological distress	a. The Neonatal Discharge Program can significantly increase self-efficacy and reduce psychological distress. b. The Internet-based program was identified as a preferred option for information retention.
3.	Garfield <i>et al.</i> (2016) ¹⁶	RCT	90 parents VLBW IG: 46 CG: 44	NICU-2-Home smartphone application	a. Parents' self-efficacy b. Ready to go home c. Length of stay (LOS)	A smartphone application used by parents of VLBW infants during the transition home from the NICU can improve parenting self-efficacy, discharge preparedness, and LOS with improved benefits based on usage.
4.	Mobbs, Spittle, and Johnston (2020) ¹⁷	RCT	26 parents of eligible infants	PreEMPT (Preterm Infant Early Intervention for Movement and Participation Trial)	a. Infant motor and developmental outcome b. Infants participation outcome c. Parents outcome	This study is in the form of planning for implementing PreEMPT (Preterm Infant Early Intervention for Movement and Participation Trial).
5.	Moradi <i>et al.</i> (2018) ¹⁸	Pretest-posttest clinical trial	60 premature infants, along with their mothers IG: 33 CG: 32	Empowerment Program	a. Maternal Discharge Preparation b. Neonatal Length of Hospital Stay	Increasing maternal discharge readiness and reducing the length of neonatal hospital stay would decrease medical costs and supply more beds for the admission of other infants.
6.	Lee <i>et al.</i> (2019) ¹⁹	RCT	30 premature infants, along with their mothers IG: 15 CG: 15	Guided participation in the discharge program	a. Parenting competence b. Stress among mothers with very preterm infants	Guided participation (GP) discharge intervention could improve parenting competence and stress among mothers with very preterm infants.
7.	Benzies <i>et al.</i> (2020) ²⁰	RCT	353 mothers and premature babies	Alberta Family Integrated Care	a. Length of hospitalization b. Psychosocial distress (anxiety, depressive symptoms, and stress) c. Parenting self-efficacy at discharge	Premature infants in the Alberta FCare™ group were discharged home 2.55 days earlier than infants in the standard care group.
8.	Mukarubayiza and Gowan (2019) ²¹	Quasi-experimental	52 mothers and 1 father	Educational training program	a. Knowledge b. Reduce stress	The educational intervention was found to be effective in increasing the knowledge of parents in caring for premature infants in the NICU district hospital in Kigali
9.	Peyrovi <i>et al.</i> (2015) ²²	Quasi-experimental before-after study design	80 mothers and premature babies EG:40 CG: 40	Empowerment program	Perceived readiness for discharge	Implementing the empowerment program is an effective strategy to promote the readiness of mothers of premature babies when they are going home.

No	Author name	Method	Participants	Intervention	Outcomes	Main findings
10.	Pineda <i>et al.</i> (2020) ²³	Quasi-experimental before-after study design	62 Family IG: 31 CG: 31	The Baby Bridge Program and Therapy Activation	a. Neurobehavioral assessment and eating b. Mother's mental health screening	The Baby Bridge program, which was used as an implementation strategy, was adopted and accepted by key stakeholders, deserves to be implemented with good precision from the main features of the program, and is associated with (a) more infants receiving early therapy services after NICU discharge and (b) fewer days from NICU discharge to early treatment visit.
11.	Hägi-Pedersen <i>et al.</i> (2017) ²⁴	RCT	IG: 80 CG: 80	<i>PreHomeCare</i>	a. the proportion of infants exclusively breastfed at 1 month b. parent-infant interaction c. baby weight d. the general well-being of the baby	This study leads to a better understanding of the effects of the PreHomeCare program and parents' experience and provides insight into the factors needed to set clear goals for the quality of treatment and early care of infants in the late stages of hospital admission/during PreHomeCare.
12.	Leets <i>et al.</i> (2020) ²⁵	RCT	135 parents	<i>Nudging Discharge Readiness With a Poster</i>	a. Readiness and independence b. Self-efficacy	a. Caregivers who had posters in the room had higher readiness than those without posters; b. The main effects of poster conditions on caregivers' perceived readiness for transition to home; c. Caregivers in the poster condition had higher readiness ratings than those in the no poster condition; d. There is no interaction between the number of hospitalizations and the poster's condition on readiness for transition to home.
13.	Ingram <i>et al.</i> (2016) ²⁶	study design before and after the intervention	245 premature baby parents	The parent-centered neonatal discharge package (The Train-to-Home package)	a. Knowledge, understanding, and trust of parents in caring for premature babies b. LOS c. Use of healthcare resources	Parents reported increased understanding of infant progress, and readiness to go home, although PMPS-E scores did not change. The number of visits to the emergency department (ED) fell from 31 in phase 1 to 20 in phase 2 ($p < 0.05$), with a significant reduction in associated health care costs (from £3400 to £2200; $p < 0.05$) after being discharged from the hospital. LOS did not change, but in both study phases >50% of infants returned home >3 weeks.
14.	Vohr <i>et al.</i> (2018) ²⁷	studi kohort prospektif 3 tahun	804 mothers and 954 babies	Transition home program (THP)	Preterm infant emergency room visits within 90 days of discharge	Enhanced THP services were associated with a 33% decreased risk of all ER visits by year 3. Social and environmental risk factors contribute to preventable ER visits

No	Author name	Method	Participants	Intervention	Outcomes	Main findings
15.	Prabhakaran and Arulappan (2021) ²⁸	Pre-experimental (one group pre-test post-test)	30 LBW baby postnatal mother	<i>Nurse-led structured teaching program (NLSTP)</i>	knowledge and practice of mothers with LBW	Poor knowledge and practice scores before intervention in the pretest. Mothers acquired a good level of knowledge, showing a marked improvement in practice after the NLSTP was implemented.
16.	Chen, Zhang, and Bai (2016) ²⁹	Quasi-experimental study	154 parents with premature babies	An educational intervention	Readiness of parents for premature baby's return	The parents' readiness for the discharge of the premature baby was at a moderate level. Discharge teaching quality explains 97% of the variance in parents' readiness to discharge premature infants. Discharge education can increase parents' readiness to discharge premature babies. The quality of discharge teaching can significantly predict parental readiness to discharge preterm infants.
17.	Banerjee <i>et al.</i> (2020) ³⁰	RCT	89 family	<i>Intervention Family Integrated Care (FIC)</i>	<ul style="list-style-type: none"> a. <i>length of stay (LOS)</i> b. <i>BB</i> c. <i>mode of feeding, breast milk</i> d. <i>the breastfeeding rate</i> 	<ol style="list-style-type: none"> 1. Infants in the IFDC group had a shorter median LOS in the neonatal unit 2. Both groups achieved high, above the national average, breastfeeding at discharge (92% and 95%) and rates of exclusive breastfeeding (46% and 39%) 3. There is a significant increase in weight gain (z-score) between the FICare models compared to the control group,
18.	Hägi-Pedersen <i>et al.</i> (2022) ³¹	RCT	188 Mothers/fathers with premature infants IG: 88 CG: 100	PreHome Care program using a smartphone with an application	<ul style="list-style-type: none"> a. Breastfeeding experiences b. BSE c. Mother-infant Interaction and Parental confidence 	The examination confirmed comparable breastfeeding proportions at discharge. Video sessions may be a feasible alternative and a critical complement during primary home care to enhance lactation continuity in moms with preterm infants.
19.	Ghomi <i>et al.</i> (2019) ³²	Quasi-experimental study	40 mothers	Health belief model-based empowerment program	The caring behaviors	Empowerment programs based on the health belief model can change the behavior of caring for mothers with premature babies.
20.	Sohrabi <i>et al.</i> (2021) ³³	Quasi-experimental	80 mothers of preterm infants IG: 40 CG: 40	The training program	<ul style="list-style-type: none"> a. Maternal role adaptation b. The self-esteem of mothers with preterm infants 	Training programs are suitable for improving maternal role adaptation and increasing mothers' self-esteem.
21.	Alwan and Ma'ala (2021) ³⁴	Quasi-experimental	30 mothers of preterm infants	Educational Program	Mother's knowledge about readiness for discharge care at home	The educational program effectively improves the mother's knowledge of the discharge care plan for preterm babies and improves the knowledge and practice of mothers caring for their premature babies at home.

No	Author name	Method	Participants	Intervention	Outcomes	Main findings
22.	Khanjari <i>et al.</i> (2021) ³⁵	Quasi-experimental with control group	72 mothers IG: 37 CG: 35	Mobile health intervention	a. The sense of coherence Quality of life of mothers with premature infants	The beneficial effects of a distance education program through mobile health software on QoL and SoC of mothers with premature infants.
23.	Orkin <i>et al.</i> (2021) ³⁶	RCT	Parents of high-risk infants (n=236)	Coached, Coordinate, Enhanced Neonatal Transition (CCENT)	a. Parenting Stress b. parental mental health, c. family empowerment	The CCENT program will reduce parental stress for parents of high-risk infants
24.	Mohammaddoost, Mosayebi, Peyrovi, M. M. Chehrzad, <i>et al.</i> (2016) ³⁷	Quasi-experimental before-after study	80 mothers with premature babies	Mother empowerment program	a. Average daily weight gain b. Average hospitalization	Providing training to mothers on how to care for premature babies can be a useful and effective method in gaining weight for premature babies and low-birth babies, and can shorten the duration of hospitalization for babies.
25.	Parhiz <i>et al.</i> (2016) ³⁸	Quasi-experimental pretest-posttest	30 premature neonate mothers	Empowerment program	a. Knowledge b. Self-efficacy, c. Self-esteem., and d. An attitude of premature neonate mother	The implementation of the empowerment program is effective in increasing the knowledge, attitudes, and self-efficacy of mothers.

RCT: Randomized Controlled Trial; EG: Experimental Group, CG: Control Group; IG: Intervention Group