

Care technologies to promote maternal health in the postpartum period: an integrative review

Tecnologias de cuidado para promoção da saúde materna no pós-parto: revisão integrativa

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ABSTRACT

Objective: to identify care technologies for promoting maternal health with an emphasis on the postpartum period. **Methods:** an integrative review was conducted in the BDENF, MEDLINE, SciELO, EMBASE, and LILACS databases, resulting in a final sample of 22 studies. **Results:** most of the technologies identified focus on providing care in the late postpartum period. Among these resources are educational manuals and videos, serial albums, data collection instruments, simulators, checklists, conversation maps, scales, protocols, and applications. The target audience for these technologies includes pregnant women, postpartum women, family members, and healthcare professionals, with a particular emphasis on nursing. The technologies cover the entire pregnancy and postpartum cycle, including pregnancy, the immediate postpartum period, and the late postpartum period. **Conclusion:** various care technologies are available to promote maternal health in the postpartum period, ranging from relational resources, such as welcoming and qualified listening, to structured tools, including clinical protocols, mobile applications, and digital platforms. **Contributions to practice:** by highlighting various technologies aimed at promoting postpartum maternal health, the study makes a significant contribution to nursing practice by expanding the possibilities of care, favoring more qualified, humanized, and evidence-based approaches.

Descriptors: Postpartum Period; Technology; Maternal Health; Health Promotion.

RESUMO

Objetivo: identificar as tecnologias de cuidado para promoção da saúde materna com ênfase no período pós-parto. **Métodos:** revisão integrativa, conduzida nas bases de dados BDENF, MEDLINE, SciELO, EMBASE e LILACS, resultando em uma amostra final composta por 22 estudos. **Resultados:** a maioria das tecnologias identificadas tem como foco a prestação de cuidados no puerpério tardio. Entre elas, recursos como manuais e vídeos educativos, álbuns seriados, instrumentos para coleta de dados, simuladores, listas de verificação, mapas de conversação, escalas, protocolos e aplicativos. No que se refere ao público-alvo das tecnologias, destacam-se as gestantes, puérperas, familiares e profissionais de saúde, com ênfase na Enfermagem. Quanto aos períodos do ciclo gravídico-puerperal contemplados, as tecnologias abarcam a gestação, o puerpério imediato e o tardio. **Conclusão:** há uma variedade de tecnologias de cuidado voltadas à promoção da saúde materna no pós-parto, desde recursos relacionais, como o acolhimento e a escuta qualificada, até ferramentas estruturadas, como protocolos clínicos, aplicativos móveis e plataformas digitais. **Contribuições para a prática:** ao evidenciar uma variedade de tecnologias voltadas à promoção da saúde materna no pós-parto, o estudo contribui significativamente para a prática de Enfermagem ao ampliar as possibilidades de cuidado, favorecendo abordagens mais qualificadas, humanizadas e baseadas em evidências.

Descritores: Período Pós-Parto; Tecnologia; Saúde Materna; Promoção da Saúde.

Introduction

The end of pregnancy and childbirth represent moments of intense physical and emotional change, requiring interventions that reduce the risks of maternal and neonatal morbidity and mortality⁽¹⁾. In Brazil, maternal mortality rates remain high, at around 35%⁽²⁾. Of the more than 130 million births that occur each year in Brazil, 303,000 result in maternal death and complications⁽³⁾.

Maternal mortality is defined as the death of a woman during pregnancy or up to 42 days after delivery, representing a sensitive indicator of the conditions of access and quality of care provided by health services to a given population⁽⁴⁾. From a conceptual perspective, maternal mortality can be divided into two groups: direct, when related to obstetric complications occurring during pregnancy, childbirth, or the postpartum period, such as in cases of hypertension, hemorrhage, puerperal infections, and abortion; and indirect, when resulting from pre-existing clinical conditions or those that arose during pregnancy but were not directly triggered by it. In both cases, factors such as negligence, inappropriate conduct, or failure to apply recommended practices in childbirth and birth care can increase its severity⁽⁵⁾. Given this, the need for healthcare tools is emphasized, as they guide the organization of work, ensuring quality and safety in healthcare services⁽⁶⁾.

Technologies applied to healthcare encompass not only the professional's knowledge but also the way they interact with the patient, as well as the methods and resources used in healthcare practice⁽⁷⁾. From this perspective, care technologies can enhance care, facilitate early identification and positive outcomes, while also promoting evidence-based practices⁽⁸⁾.

From this perspective, the use of technologies in healthcare improves the quality of care, enabling the early detection of complications, contributing to better clinical outcomes, and encouraging the implementation of evidence-based practices⁽⁷⁾. Thus, such technologies encompass the technical and scientific

knowledge of the professional, their way of interacting with the patient, and the strategies applied to the care process. It is up to healthcare professionals to critically reflect on the production and application of these resources in their daily practice⁽⁸⁾.

Considering the above, it is noted that adherence to care guidelines and technologies can significantly reduce the incidence of complications, thereby improving outcomes⁽⁹⁾. Among the benefits are computerization, the possibility of early diagnosis of complications, and more effective communication among members of the healthcare team⁽¹⁰⁾.

Recognition of existing postpartum care technologies is scarce. Therefore, identifying them may provide support for the subsequent development of strategies and other care technologies for this phase, which is less prioritized when considering relevant topics or those aimed at vulnerable populations.

Thus, the objective to identify care technologies for promoting maternal health with an emphasis on the postpartum period.

Methods

Type of study

This is an integrative review, conducted in six distinct stages: formulation of the research question; identification and selection of primary studies; extraction of relevant information; critical evaluation of the selected material; synthesis of findings; and, finally, presentation of the review results⁽¹¹⁾.

Definition of the research question

The research question was developed based on the PVO (population, variables, outcomes) strategy, formulated as follows: What care technologies are described in the literature aimed at promoting maternal health in the postpartum period? This formulation is represented in Figure 1.

Item	Alternative term	Descriptors	Scope note
Population	Puerperium Postpartum Postpartum women	Period Postpartum	In females, it encompasses the period immediately following birth (parturition).
Variable	-----	Technology	The application of scientific knowledge for practical purposes in any field. It includes methods, techniques, and instrumentation.
	Educational Technologies	Educational Technologies	Systematic identification, development, or use of educational resources and the handling of these processes.
	Technology Applied to Healthcare Technology Applied to Healthcare Nursing Technology Health Technology	Biomedical Technology	Applying technology to solve medical problems.
Outcome	-----	Maternal Health	Women's health during pregnancy, childbirth, and the postpartum period.
	-----	Obstetric Nursing	Nursing care is provided to pregnant women before, after, and during childbirth.
	-----	Health Promotion	Encourage healthy behavior and optimize health potential through access to health information, preventive programs, and quality care.

Figure 1 – Application of the strategy for defining the review question. Crato, CE, Brazil, 2024

Search and selection of primary studies

The paired search for articles took place on May 16. Selection was carried out between May and July 2024 in the following sources: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Health Sciences Literature (LILACS) and Nursing Database (BDENF) databases via the Virtual Health Library (VHL), Medical Literature Analysis and Retrieval System Online (MEDLINE) via the National Library of Medicine and the National Institutes of Health (PubMed) portal, and EMBASE.

The descriptors obtained from the Health Sciences Descriptors (DeCS) and their respective combinations in English, extracted through Medical Subject Headings (MeSH), were used. To perform the advanced search, all corresponding DeCS and MeSH terms were cross-referenced (Figure 1), with the Boolean operator “AND” applied in the search strategies used. Please note that a customized search strategy was developed for each database consulted, utilizing the corresponding DeCS and MeSH descriptors.

Selection and Analysis

Studies related to the guiding question and available for full-text analysis were included. Duplicate studies in the same database and repeated studies in different databases were excluded, as were unindexed studies such as theses, dissertations, editorials, annals, and reports. No time frame or language limitation was established to obtain a wider selection of publications.

To assist in the selection of articles, the findings from the databases were sent to the Rayyan QCRI software, which helped identify and remove duplicate records, as well as screen and select the studies that were part of the review⁽¹²⁾.

The search of the databases yielded a total of 7,127 studies. After removing 6,956 duplicate records identified by the reference manager, 171 studies were initially evaluated by their titles and abstracts in a process conducted independently by two researchers, following the previously defined eligibility criteria. In case of disagreement, a discussion was held to reach a

consensus. At the end of this stage, 144 studies were excluded, 35 because they were non-formal literature and 87 because they did not address the theme related to the guiding question. The final sample consisted of 22 publications.

For use solely as a research report, an adaptation of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart⁽¹³⁾ was employed. The process of data analysis and interpretation was methodologically categorized through synthesis, data analysis (coding and summarization), reduction, and comparison of data⁽¹⁴⁻¹⁵⁾.

Summary of findings and presentation of results

During the data extraction phase, an adaptation of the developed and validated instrument was used, which enabled the individualized analysis of each study, focusing on the identification of the most relevant information⁽¹⁶⁾. The data obtained were organized in a spreadsheet created in Microsoft Word 2019 software to facilitate the systematization, visualization, and interpretation of the findings.

Ethical aspects

Considering that only publicly available data was used, with no involvement of human subjects or information that required ethical confidentiality, it is justified not to submit it to the Research Ethics Committee.

Results

Regarding the year of publication of each study, the following distribution was observed: two in 2013 (9.1%); one in 2015 (4.6%); three in 2016 (13.6%); one in 2017 (4.6%); one in 2018 (4.6%); one in 2019 (4.6%); four studies in 2020 (18.1%), representing

the highest percentage; two in 2021 (9.1%); three in 2022 (13.6%); two in 2023 (9.1%); and two in 2024 (9.1%). Regarding language, 15 studies were published in Portuguese, six in English, and one in Spanish.

In the first stage of the search, the titles and abstracts were read, followed by the application of eligibility criteria. Subsequently, the texts were read in full, after which the same criteria were reconsidered. The results are described in figure 2.

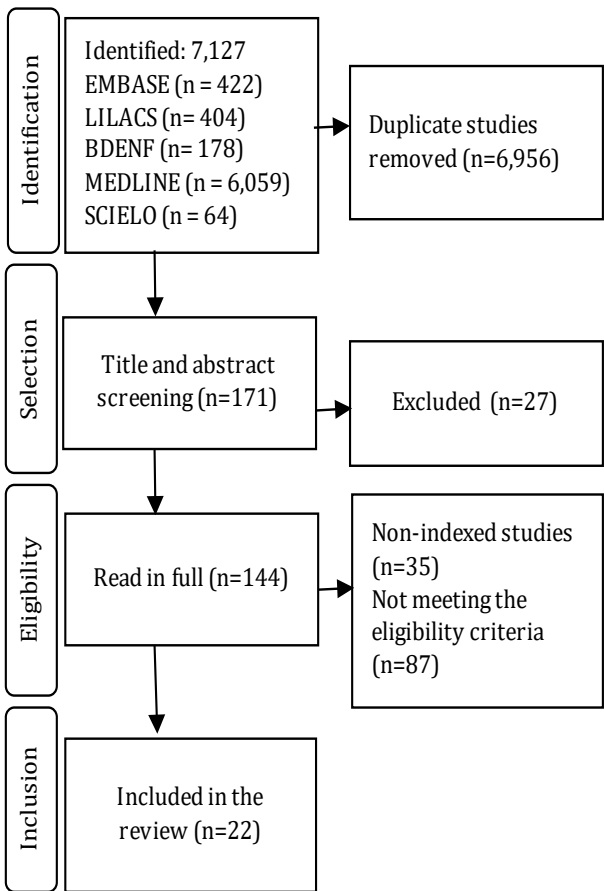


Figure 2 – Flowchart of the process of identification, screening, eligibility, and inclusion of studies in the review. Crato, CE, Brazil, 2024

The technologies are presented according to the variables: author, year, country, technology, and main results, and have been labeled “T” (Figure 3).

T*	Author/Year/ Country	Technology	Results
T1	Costa et al ⁽¹⁷⁾ 2013 Brazil	Educational guide	Regarding the degree of relevance of the texts and figures, the content validity index was calculated, which reached an excellent overall value (0.97) after the modifications and exclusions suggested in the validation. The final educational manual was prepared with a total of 13 figures/explanatory texts.
T2	Dodt et al ⁽¹⁸⁾ 2013 Brazil	Album series	Seeing the pictures enabled the mothers to identify real situations, simulated in the album, and use them to discuss coping strategies. It was found that most of the situations brought their own knowledge to the context exposed by the pictures; the technology used was configured as a space in which doubts about breastfeeding management could be raised and discussed.
T3	Silva et al ⁽¹⁹⁾ 2015 Brazil	Instrument for data collection and implemen- tation of the Systematization of Nursing Care	All the items in the instrument were deemed relevant, sufficient and adequate to identify the alterations that had occurred and to enable the identification of nursing diagnoses, with a concordance index varying between 0.80 and 1.00. Eighteen nursing diagnoses and 52 interventions were selected.
T4	Abissulo et al ⁽²⁰⁾ 2016 Brazil	Simulators	The items whose answers obtained a level of agreement greater than or equal to 70% for the sum of the "adequate" and "totally adequate" scores in the experiment group were validated, considering the total sum to be 192 (100%). Simulators were created and validated to facilitate learning about breastfeeding management.
T5	Melo et al ⁽²¹⁾ 2016 Brazil	Care protocol	The protocol was developed based on 25 references and validated with a general content validity index of 0.96, a content validity index for the objectives ranging from 0.96 to 1.00, and a content validity index between 0.92 and 1.00, as well as a relevance index of 0.96.
T6	Teixeira et al ⁽²²⁾ 2016 Brazil	Album series	The serialized album called "Postpartum care" was evaluated by the judges with a content validity index of 81.23%. It proves to be an effective instrument for health education.
T7	Herrick et al ⁽²³⁾ 2017 Africa	Model: Low- cost balloon uterine tam- ponade	The base case model estimated that the widespread use of low-cost balloon uterine tamponade in clinics and hospitals could save 6,547 lives (an 11% reduction in maternal deaths), avoid 10,823 surgeries, and prevent 634 cases of severe anemia in sub-Saharan Africa annually.
T8	Carvalho et al ⁽²⁴⁾ 2018 Brazil	Checklist	Adapted for Brazil, it was called the Safe Childbirth Checklist - Brazil, containing 49 items. In the first stage, the 29 items of the original document were approved with some adaptations. In the second stage, adjustments were made to 29 of the original items, and 24 additional items were added. In the third stage, three items were excluded, two were grouped together, and one was added.
T9	Fontenele et al ⁽²⁵⁾ 2019 Brazil	Conversation map	The Map shows four scenes that illustrate the mothers' way of life: 1) feelings of the pregnant woman, 2) newborn care involving vaccination and neonatal screening, 3) hand washing, and 4) prevention of sudden infant death. In this study, a Flesch Reading Ease Index of 80% or higher was established as acceptable, which allowed the text to be classified as easy for the general population to read. The study valued the experiences and perspectives of pregnant women during the map's construction, an essential condition for community empowerment.
T10	Fantinelli et al ⁽²⁶⁾ 2020 Brazil	Scale Fantinelli	Agreement was satisfactory at 80% or more. The average total score of the 13 items was 22.5±4.2, with 52.9% classified as intermediate. For psychometric validation, the Fantinelli Scale instrument yielded a score of 0.73 points, falling within the range of 0.70 to 0.74 points.
T11	Pantoja et al ⁽²⁷⁾ 2020 Brazil	Sepsis protocol	A total of 51% of the professionals received training on the sepsis protocol, and, afterwards, 50% of the patients who met the criteria were included in the sepsis protocol. 03 of these patients were discharged from the hospital, and 02 were transferred to the intensive care unit due to severe sepsis. The average time taken to administer the antibiotic was 50 minutes; to request a blood count was 46.25 minutes, and the lactate result was over 30 minutes.
T12	Ribeiro et al ⁽²⁸⁾ 2020 Brazil	Educational technology - Animation and video	Educational technology utilized animation and video techniques to illustrate, respectively, key elements of lactation physiology and the target population. An overall content validity index of 0.84 was obtained.

(the Figure 3 continue in the next page...)

"T"*	Author/Year/ Country	Technology	Results
T13	Ziganshin et al ⁽²⁹⁾ 2020 Russia	Gravimetry and 3D modeling	The volume of blood loss was determined in three ways: visually, by the gravimetric method, and by integrating the gravimetric method with 3D modeling of the ultrasound results of the postpartum uterine cavity. In Group 1, the visual method yielded 275.0ml, the gravimetric method yielded 375.0ml, and combining the gravimetric method with ultrasound-based 3D modeling of the postpartum uterus yielded 420.0ml. In Group 2, the volume of postpartum blood loss was estimated visually to be 725.0 mL, by gravimetry to be 1,010.0 mL, and by gravimetry combined with 3D modeling to be 1,240.0 mL.
T14	Barros et al ⁽³⁰⁾ 2021 Brazil	Application	In the case of the interfaces, four parameters subdivided into 10 sub-items were assessed by the nursing judges, achieving an overall agreement of 1.0. The IT judges evaluated the system in six parameters subdivided into 16 sub-items, achieving an overall agreement of 0.92.
T15	Dang et al ⁽³¹⁾ 2021 China	Nomogram to predict severe postpartum hemorrhage	There were 204 patients (23.58%) in the development cohort and 80 patients (26.06%) in the validation cohort who presented with postpartum hemorrhage. In the development cohort, the areas under the Receiver Operating Characteristic curve of the preoperative nomogram and the intraoperative nomogram were 0.831 (95% CI, 0.804, 0.855) and 0.880 (95% CI, 0.854, 0.905), respectively.
T16	Abreu et al ⁽³²⁾ 2022 Brazil	Postpartum stress in child-care scale	The α -Cronbach indicator was 0.894. The Brazilian version tested proved to be unidimensional, and the factor analysis showed four factors that were very closely distributed and explained 57.8% of the variance. All the items from the original instrument were kept in the final version proposed.
T17	Dantas et al ⁽³³⁾ 2022 Brazil	Educational video	The video, which lasted seven minutes and thirty-eight seconds, was validated using an overall content validity index of 0.97 and 1.00, respectively. All the items assessed in terms of functionality, usability, efficiency, audiovisual technique, environment, procedure, objectives, organization, video style, appearance, and motivation achieved indices equal to or greater than 0.95.
T18	Silva et al ⁽³⁴⁾ 2022 Brazil	Application	About the level of agreement between the evaluators, the following classification was obtained: in the functionality dimension 99%, in the confidentiality and accessibility dimension, 100% and in the feasibility dimension, 85% agreement in the first round and 100% agreement in the second Delphi round, considering a Likert score between 4 and 5.
T19	Sousa et al ⁽³⁵⁾ 2023 Brazil	Application	The application had a content validity index of 0.89 as assessed by the experts and 0.93 by the pregnant and postpartum participants, resulting in an overall content validity index of 0.91. The level of agreement between the professionals and the participating pregnant and postpartum women was 93.7% and 95.8%, respectively, resulting in an overall level of agreement of 94.8%.
T20	Sun et al ⁽³⁶⁾ 2023 China	Scale	The content validity index of the Chinese version was 0.867. After item reduction analysis, the instrument consisted of 30 five-point Likert items. The Cronbach's alpha value and the Spearman-Brown split-half reliability for the total scale were 0.979 and 0.941, respectively.
T21	Arora et al ⁽³⁷⁾ 2024 United States	Checklist	One third of the sample (35.59%) was diagnosed with post-traumatic stress disorder due to childbirth. A cut-off value of 28 optimized sensitivity (0.81%) and specificity (0.9%), and correctly diagnosed 86% of the women. A higher value (32%) identified individuals with more severe symptoms of post-traumatic stress disorder (specificity, 0.95%), but with lower sensitivity (0.62%), including depression and anxiety.
T22	Green et al ⁽³⁸⁾ 2024 United States	Application	The main topics of discussion included accessibility to healthcare and resources due to rurality, issues involving race and perceived racism, mental and emotional well-being during the postpartum period, and perspectives on the app. Participants emphasized the challenges black postpartum women face in relation to accessibility, racism and discrimination, and mental health. The women favored the mHealth tool as relevant and highlighted the need to adapt the app to address disparities.

*T: Technology

Figure 3 – Characterization of studies on care technologies to promote maternal health in the postpartum period. Crato, CE, Brazil, 2024

The presentation and analysis of the results were structured around three central themes: 1) characterization of studies on care technologies aimed at promoting maternal health in the postpartum period, using the instrument used to collect the information as a reference. 2) Synthesis of knowledge based on the presentation of the focus of care technologies for promoting maternal health in the postpartum period; 3) Systematization of information on postpartum care addressed in the technologies.

Focus on care technologies to promote maternal health in the postpartum period

The findings demonstrate a differentiation between the studies that comprise this review. Most technologies focus primarily on care during the postpartum period (subdivided into immediate and late postpartum). Some, although mainly directed at pregnancy, consider aspects that encompass the stages of childbirth and the postpartum period, considering them as inseparable phases of the gestational period. Regarding the target audience, the technologies prioritize pregnant women, family members, postpartum women, healthcare professionals, and nurses.

Regarding the areas addressed by care technologies, it was possible to identify distinct periods and target audiences. These are summarized in Figure 4.

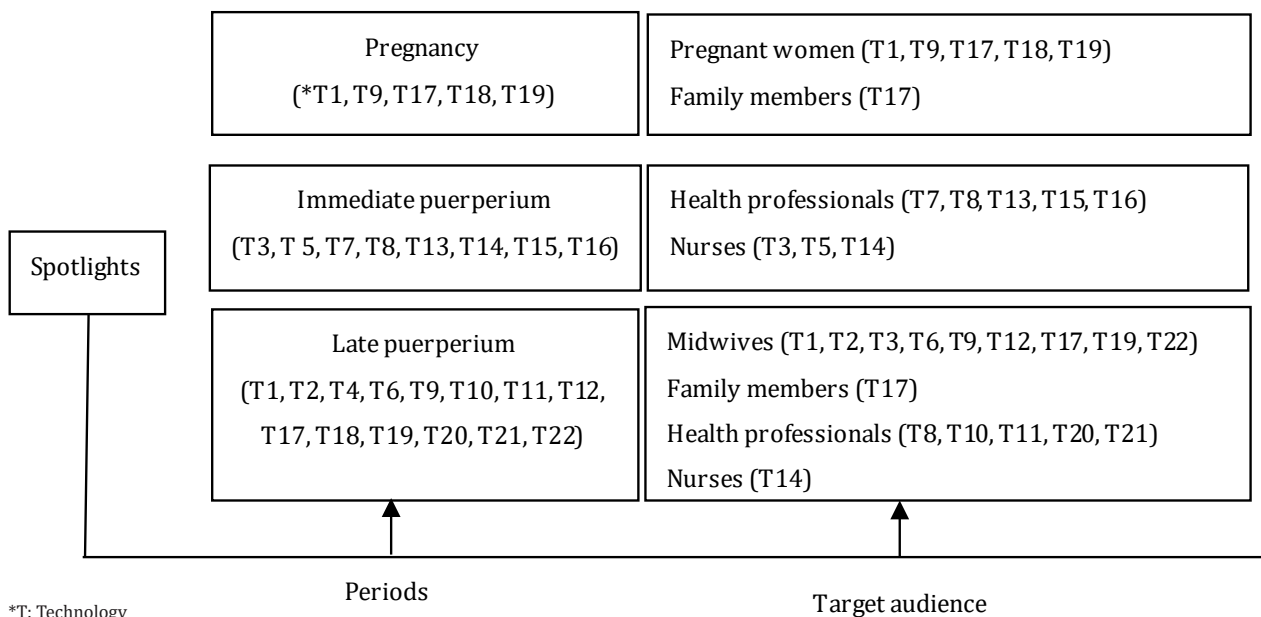


Figure 4 – Focus of the care technologies included in the review. Crato, CE, Brazil, 2024

Discussion

The first technology mentioned in the selected studies was an educational manual⁽¹⁷⁾. The material was organized into five thematic areas, each accompanied by illustrations and corresponding explanatory texts. Domain A focuses on proper positioning during breastfeeding; Domain B addresses the benefits of breastfeeding for the child; Domain C covers the health benefits for the mother; Domain D discusses the

main changes to the breast; and Domain E refers to the necessary breast care.

Two studies describe the development of serial albums. The album “I Can Breastfeed My Child” aims to reinforce women’s confidence in breastfeeding, using illustrations and script cards to demonstrate that they possess the necessary knowledge and skills to breastfeed their children successfully⁽¹⁸⁾. The other, called “Postpartum Care,” aims to familiarize new mothers with everyday situations, covering aspects such

as physical and sexual changes, feelings of sadness associated with postpartum depression, uncertainties related to personal hygiene, physical activity, and other issues specific to this period⁽²²⁾.

Four other technologies were developed for healthcare. The first created a tool to support the documentation of nursing care during the immediate postpartum period. The instrument covers aspects related to the nursing process in the postpartum period, including guidance on breastfeeding, newborn behavior (such as crying), hygiene care, sleep and rest patterns, physiological functions, and physical assessment of the postpartum woman⁽¹⁹⁾.

The second developed a care protocol focused on nursing care in the pre-delivery, delivery, and post-delivery stages, which includes a flowchart that guides the care of the parturient. The protocol also presents recommendations and guidelines for obstetric nursing regarding the use of non-invasive care technologies, with a focus on promoting comfort and humanizing care⁽²²⁾. The third technology developed consisted of a conversation map aimed at guiding pregnant women and new mothers on newborn care⁽²⁵⁾. The fourth corresponds to a specific protocol for sepsis, developed to promote awareness among health professionals and encourage participation in training related to its application in obstetrics and gynecology units⁽²⁷⁾.

Three other technologies used audiovisual media to promote health education. The first used realistic simulators to guide postpartum women on breastfeeding, using an apron with breasts, a baby doll, and puppets⁽²⁰⁾. The others were conducted through animation and video: a two-minute video clip addressed the physiological changes of lactation, from pregnancy to childbirth⁽²⁸⁾; another involved the construction of a storyboard, which represents a graphic sequence of actions. It demonstrates how prenatal consultation is conducted within the context of nursing, through dialogic interaction between the nurse and those responsible, with a focus on the value of breastfeeding and its importance for family health⁽³³⁾.

Four selected studies addressed the production of applications. Among the main topics addressed were safe postpartum care, bedside care for postpartum women, monitoring of pregnant and postpartum women, health education on pelvic floor muscles, and interventions with women shortly after discharge that can help individualize and formalize support for mothers in the early postpartum period^(30,34-35,38).

One of the technologies also addressed was scales. Their objectives were to analyze the degree of complexity of care provided to postpartum women and newborns in the context of rooming-in, identify the level of maternal stress associated with childcare demands, and measure women's overall perception of the quality of care received during the postpartum period^(26,32,36). Two other studies address checklists; the first deals with cultural adaptation and validation of the World Health Organization (WHO) Safe Childbirth Checklist for Brazilian hospitals⁽²⁴⁾, and the second list deals with post-traumatic stress disorder among women who have undergone traumatic deliveries⁽³⁷⁾.

Among the various care technologies available, there are three methods for managing and controlling postpartum hemorrhage. The first proposed a "UBT Model: low-cost uterine balloon tamponade," generating estimates for cases of uterine atony, retained placenta, and lacerations⁽²³⁾. The second technology is "Gravimetry and 3D modeling" to determine the volume of postpartum hemorrhage based on ultrasound examination results⁽²⁹⁾. The third technology addresses the use of a nomogram to predict severe postpartum hemorrhage in women undergoing cesarean section⁽³¹⁾.

Regarding the care technologies available for promoting maternal health in the postpartum period, 16 of the 22 studies in the sample were technologies developed in Brazil. Scientific production follows this growth trend, as evidenced by the significant increase in the number of articles published in national journals⁽³⁹⁾.

A disparity was observed in relation to the periods covered by each study, which varied between

pregnancy, immediate postpartum, and late postpartum, with the latter being the period most frequently addressed in the studies. It is essential to return to nursing care for the challenges in the immediate postpartum period, as this is necessary to achieve better results, especially in actions taken during the first hours after delivery⁽⁴⁰⁾.

The general experience of postpartum women with postnatal care was examined, and it was found that the main issues raised were related to the timely provision of care in cases of complications, the availability of competent human resources, and the sufficiency of physical resources. In addition, continuous assessment by health professionals⁽³⁶⁻³⁷⁾. They also felt that their rural towns did not have adequate health facilities to accommodate and monitor them effectively⁽³⁸⁾.

Additionally, there is a tendency to note that women assisted by obstetric nursing professionals had greater access to good childbirth care practices than those assisted in the traditional model without their presence⁽⁴¹⁾.

There were technologies specifically designed for nursing, but they did not delve into the application of the Nursing Process⁽²¹⁻³⁰⁾. The practical implementation of the Nursing Process still faces significant barriers. Among the main limiting factors are work overload, individual characteristics of professionals, such as resistance to change, perception of devaluation, low familiarity with the method, and insufficient knowledge about its stages⁽⁴¹⁾.

As a result of the late postpartum period being the most prevalent period in the studies that comprised the review, it was noted that the most predominant theme was breastfeeding and related issues. Although addressing these issues is of great value, it should be noted that it is in the immediate postpartum period that many women die.

One of the care measures identified as necessary in the immediate postpartum period was the assessment of the integrity of the birth canal, without specifying care for blood loss. It also mentioned the

importance of pain perception, as well as support for other demands by postpartum women, such as the need for sleep and rest⁽¹⁹⁾. The importance of ensuring maternal well-being through adequate caloric intake was highlighted, but without specifying how this should be achieved⁽²¹⁾.

In the late postpartum period, one aspect highlighted is personal hygiene. Three studies^(19,23,34) emphasized that the popular tradition of confinement is characterized by uncertainties and excessive care, permeated by cultural beliefs and practices that often imply restrictions on women's hygiene in the postpartum period. The technologies developed also provide guidelines for health professionals to promote self-care guidance in the postpartum period.

Regarding the difficulties faced in the postpartum period, anxiety, insecurity, stressful situations, and difficulty sleeping were mentioned, which can be triggered or intensified by the baby's crying, in addition to breast problems, which would require preventive breast care^(17-19,32,34,36). Other, more serious difficulties were pointed out, including direct causes of maternal death, such as hypertensive diseases, hemorrhages, and postpartum infections, as well as indirect causes, such as circulatory system diseases aggravated by pregnancy, childbirth, or the postpartum period. Additionally, preexisting infections were listed as potential difficulties that may arise and require risk assessment and care^(24,31).

Only three studies highlighted the importance of healthcare professionals assessing the risk of infection and sepsis during the puerperium^(19,24,27). Regarding postpartum hemorrhage, although it is one of the main indicators of maternal mortality, the topic was addressed in only five studies^(19,23-24,29,31). These studies emphasized the need to assess the volume of external blood loss to enable an accurate determination of total postpartum blood loss, constituting an essential aspect of maternal safety care. Two of these studies applied the technologies during cesarean care^(23,31).

The possible maternal causes associated with women's permission for some unnecessary interven-

tions during childbirth are the main ones, being limited understanding of the functions and dysfunctions of the pelvic floor, their rights, and difficulty in recognizing obstetric violence⁽³⁵⁾. In addition, practices such as intense medicalization, disrespect for the autonomy of the pregnant woman, episiotomy, and instrumental delivery, among others, contribute to increased risks for pregnancy, delivery, and the postpartum period^(24,31).

The knowledge and education of postpartum women were specified in the studies^(19-20,22,25,32,35). One of them emphasizes that access to information is a fundamental element for strengthening the self-confidence of postpartum women, favoring their ability to face and overcome challenges⁽⁴⁷⁾. However, educational level or number of years of schooling does not guarantee success in breastfeeding and personal care. It is possible that a postpartum woman, despite having extensive schooling and understanding the benefits of breastfeeding, may not express interest or willingness to breastfeed⁽²⁰⁾. In this context, it is essential to consider and address such disparities⁽³⁸⁾.

Study limitations

It is worth noting that some full articles could not be accessed, which may have limited the scope of the evidence analyzed, as well as research that may not have been indexed in the databases previously selected at the time of data collection, thus remaining outside the analytical corpus. These limitations, inherent to reviews of this nature, should be taken into account when interpreting the results.

Contributions to practice

The research makes a significant contribution to nursing practice by highlighting various technologies designed to promote maternal health in the postpartum period. These tools expand the possibilities for care, favoring more qualified, humanized, and evi-

dence-based approaches. Additionally, it emphasizes the crucial role of nursing professionals in monitoring postpartum women and their families. It also highlights the need for greater attention from these professionals to the immediate postpartum period, a period that has been little explored in literature.

Conclusion

There are various care technologies, including manuals, educational videos, serial albums, data collection tools, simulators, checklists, conversation maps, scales, protocols, applications, and other tools. These technologies have proven effective in promoting maternal health during the postpartum period, ranging from relational resources, such as welcoming and qualified listening, to structured tools, including clinical protocols, mobile applications, and digital platforms for guidance and monitoring. However, there is a notable lack of studies specifically focused on the immediate postpartum period, indicating a significant gap to be explored by research and healthcare practice.

Authors' contribution

Conception and design or analysis and interpretation of data: Dias TA, Belém JM, Cruz RSBLC. Manuscript writing or critical review of intellectual content; Final approval of the version to be published; Agreement to be responsible for all aspects related to the accuracy or integrity of any part of the manuscript being investigated and resolved appropriately: Dias TA, Belém JM, Cavalcante EGR, Oliveira CJ, Oliveira DR, Pinto AGA, Cruz RSBLC.

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