Use of mobile applications as a strategy to support family members in the care of newborns: a scoping review protocol

Utilização de aplicativos móveis como estratégia de apoio a familiares no cuidado a recém-nascidos: protocolo scoping review

ABSTRACT

Objective: To map and describe the studies available in the literature and online stores on mobile applications to support family members of newborns. Method: This is a scoping review protocol, prepared following the recommendations of the Joanna Briggs Institute and the items of the PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. The search will be carried out in two stages: 1 - in PubMed, CINAHL, Web of Science, Scopus, LILACS, Embase, Cochrane Library, Google Scholar, and Scielo databases, and in the VHL, the Latin American Theses and Dissertations Portal, and the catalog of theses and dissertations of the Coordination of Improvement of Higher Education Personnel; 2 - in the online stores of Android and iOS operating systems, through the independent use of the term “newborn”. The protocol will guide the development of the scoping review for the description and mapping of mobile applications to support family members of newborns.

Descriptors: Newborn Infant; Family; Mobile Applications.

INTRODUCTION

The birth of a baby significantly marks the life of a family. However, this moment can be followed by intercurrences and, consequently, there is a need for newborn (NB) care\(^1\), whether at home or in hospitals. Health care for newborns has undergone significant transformations\(^2\) as the technology evolved and characterizes a broader universe in care, also including parents in this context, through “mobile health” (m-health)\(^3,4\). The term mHealth is used to describe any healthcare practice assisted by mobile devices\(^5\), and it is pointed out as a quick and direct method of distributing information to groups of users\(^6\). These transformations are in line with the Sustainable Development Goals (SDGs) included in the health agenda through “SDG 3: Good Health and Well-being”, which intends that by 2030 there will be no infant and neonatal mortality from preventable causes\(^7\). The proposal of this protocol is in line
with the SDGs when addressing the support to the family members of NBs concerning their care. The growing acceptance and use of computer technology by society and the wide access due to the expansion of mobile technology greatly influence health promotion and prevention. In this sense, through health promotion, based on scientific evidence, family members can be encouraged to adopt good care practices for their NBs\(^3\), including basic care, such as adequate heat, hygiene, and exclusive breastfeeding\(^8\).

Inserted in the context of health promotion, the production of technology that favors the care and prevention of diseases in NBs should be encouraged, as long as the technical and content quality permeates this process. The development of educational technologies aimed at NBs’ parents, is necessary to gather knowledge on the social, cultural, and economic context in which these persons are inserted\(^3,9\). Likewise, it is necessary to understand if access is being guaranteed, through technological devices, if family members feel good when using the applications, and if they can process the information, transforming superficial learning into meaningful ones\(^3\).

In this scenario, mobile technologies (tablets and smartphones, among others) stand out, especially the use of mobile applications (apps) by the world population. These apps aim to contribute to people’s access to information and knowledge, via the world wide web (internet), without the restriction of time and space, which also allows new forms of communication\(^10\). Given the above, different software from all areas of health care are being created or improved.

From this perspective, there is a perception of the popularization of smartphone use and the growing applicability of functions with access to the internet and social networks. A study points out that, in Brazil, the use of smartphones in the year 2019 surpassed the use of computers. There are 410 million internet-connectable devices, 180 million computers, and 230 million smartphones, representing more than one smartphone for each inhabitant\(^11\).

The construction of this protocol took place in the face of the presented scenario and it is justified by the need for an in-depth approach to mobile applications to support family members in the care of NBs. To meet the above demand, it is necessary to map the available evidence on this topic, as there is a lack of knowledge regarding research that evaluates the development and availability of mobile applications as a support strategy for family members in the care of newborns. Therefore, the objective of this study was to map and describe the studies available in the literature and online stores on mobile applications to support family members of newborns.

**METHOD**

This is a protocol for a scoping review study that can be used to map studies, clarify word definitions or study concepts, summarize the evidence and inform future research\(^12,13\). The study proposed will be conducted according to the Joanna Briggs Institute (JBI) methodology for scoping reviews\(^11-14\). The protocol was registered in the Open Science Framework (OSF), available at https://osf.io/vtyce/DOI 10.17605/OSF.IO/VTYCE.

To define the research question and the study’s objective, the mnemonic PCC (Population, Concept, and Context), proposed by the JBI, will be used, as it is better suited to the review’s objectives. Thus, the following categorical structures of interest to the study were defined: Population (P): parents and relatives of newborns; Concept (C): studies that address mobile applications in the field of neonatology; and Context (C): newborn care. From this structure, the review question was elaborated.

**Review question**

Which mobile applications developed to support family members in the care of newborns exist in the literature or are available in online stores of Android and iOS operating systems?

**First step**

Search in the databases and portals of the Virtual Health Library, the Latin American Theses and Dissertations Portal, and the catalog of theses and dissertations of the Coordination of Improvement of Higher Education Personnel (Capes).

**Eligibility criteria**

**Inclusion criteria**

Publications that respond to the study’s objective, original scientific articles, with a descriptive, analytical, quantitative, or qualitative approach, theses, dissertations, with no time restriction, with no language restriction, available in full format and free of charge, electronically. Studies in editorial format, letters to the editor, opinion articles, advertisements, and gamified applica-
tions will not be included in the study. Duplicate documents will be counted only once.

**Search strategy**

Initial search strategies will be carried out for each of the bases: PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Scopus, Latin American and Caribbean Health Sciences Literature (LILACS), Excerpta Medica Database (Embase), Cochrane Library, Google Scholar, Scielo, and Virtual Health Library (VHL), as well as gray literature (dissertations and theses), through the Latin American Theses and Dissertations Portal and the catalog of theses and dissertations of the Coordination of Improvement of Higher Education Personnel (CAPES).

For the initial search, the “advanced search” feature will be used, using the MeSH (Medical Subject Headings) and DeCS (Health Sciences Descriptors) descriptors and the Boolean operators AND and OR. The strategy used for the search in the Latin American Theses and Dissertations Portal and the Dissertations Portal and the catalog of theses and dissertations of CAPES will be the use of a solitary term as well as a the use of crossed terms without the Boolean operators. The strategy will integrate the following cross-referenced terms in Portuguese: recém-nascido OR recém-nascido prematuro AND família OR pais AND aplicativos móveis OR dispositivos móveis OR intervenção baseada na internet OR app móveis OR acesso à internet OR acesso à informação online. In English, the following terms will be used and crossed: newborn OR infant AND parents OR family AND mobile applications OR educational technology OR technology OR app mobile AND neonatology. The follow controlled descriptors will be used: app móveis, app mobile, aplicativos para dispositivos móveis, aplicativo móvel. The description of the crossings is presented in Figure 1.

A tertiary search will be carried out in the reference lists of all the literature that meets the inclusion criteria of this study to identify additional studies. The studies selected in this search will be evaluated similarly to the other studies. In case of the addition of documents, these will be released separately and duly identified in the presentation of results.

**Selection of studies**

Once the articles are searched in the databases/portals, they will be exported to a spreadsheet for later grouping and removal of duplicates. The organization of the full text of the studies will occur by using folders created for this purpose that will be evaluated by two independent reviewers who will analyze the inclusion and exclusion criteria in depth. A third reviewer will be consulted in case of disagreements between the two reviewers at each stage of the process to systematize the scoping review and reduce research bias during the selection of studies. Full-text studies that are excluded will have the reasons for not meeting the inclusion criteria recorded and will subsequently be reported in the review. The study selection procedure is shown in Figure 2. This review decision process will be presented in a flow diagram format.

**Data extraction strategy**

Two independent reviewers will also extract data from the studies included in the scoping review, using a data extraction tool developed for this review (Figure 3). Before starting the extraction, the authors will conduct a pilot test with a random sample of five articles to test the form. If modifications are required, these will be detailed in the full scoping review.

**Data presentation**

The data will be summarized and the panorama of the information recovered will be presented, as well as the extension and the literary nature of the applications created to support family members in the care of NBs. Tables, charts, or diagrams of the extracted data will be presented, as shown in Table 3. The descriptive and narrative analysis will accompany the identified and mapped results, describing how these results relate to the scoping review’s objective and question.

**Second stage**

Search in online stores of Android and iOS operating systems.

In each online store, searches will be performed using the term "newborn". The data collection will be performed by two independent and previously trained researchers. This collection is not related to the collection that will be conducted at the first stage of the review.

**Application of eligibility criteria**

Inclusion criteria

The applications must address contents on newborn care for family members.
If random (Figure 4) that will be pilot tested through a consisting of 12 variables about the applications (Figure 4) that will be pilot tested through a random extraction of data from five applications. If necessary, specific adjustments will be made to the instrument or as they arise during the process. The modified version will be detailed in the full scoping review.

Two independent reviewers will perform the data extraction, and, if necessary, a third reviewer will be consulted in case of doubts.

Exclusion criteria
Applications not available for download, in free or paid forms (closed or internal tests), gamified applications, or applications from products will be excluded. Duplicate applications will be counted only once.

Data extraction strategy
An instrument will be developed for this study, consisting of 12 variables about the applications (Figure 4) that will be pilot tested through a random extraction of data from five applications. If necessary, specific adjustments will be made to the instrument or as they arise during the process. The modified version will be detailed in the full scoping review.

Synthesis and presentation of data
The final data will be presented descriptively and through tables, graphs, or diagrams that facilitate the visualization of the results. Descriptive statistics will be used for data analysis, expressed by absolute and relative frequencies.
Figure 2 - Study selection procedure. Londrina, PR, Brazil, 2022
Source: Prepared by the authors, 2022.

<table>
<thead>
<tr>
<th>Selected study data</th>
<th>Details</th>
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<td>Authors</td>
<td>Last name/First name (Vancouver style)</td>
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<tr>
<td>Year</td>
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<td>Level of evidence</td>
<td>I, II, III, IV, V, VI, VII or VIII</td>
</tr>
<tr>
<td>Application name</td>
<td>Describe the name of the application or what it is called in the study</td>
</tr>
<tr>
<td>Application purpose</td>
<td>Describe the theme/main purpose of the application/theme of support for family members</td>
</tr>
<tr>
<td>Area of applicability of support to family members</td>
<td>E.g.: Hospital, primary care, mental health (etc.)</td>
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</tbody>
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Figure 3 - Instrument for data extraction. Londrina, PR, Brazil, 2022
Source: Prepared by the authors, 2022.
**User involvement and ethical aspects**

The users and developers of the apps were not involved in the development of this protocol, nor will they be involved in later stages. The authors of this review protocol do not have conflicts of interest and emphasize that the results will be published preferably in open access journals or presented at relevant scientific events.

**CONFLICT OF INTEREST**

The authors have declared that there is no conflict of interest.

**REFERENCES**


AUTHORSHIP CONTRIBUTIONS

<table>
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<tr>
<th>Project design: Araujo JP, Gallo AM</th>
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<td>Data analysis and interpretation: Araujo JP, Gallo AM, Parada CMGL, Marcon SS, Ferrari RAP,</td>
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