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Protocolo de Revisión

Mobile Health Interventions for Improving Health Outcomes in Childhood: A Scoping Review Protocol.

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Abstract

Introduction: The use of mobile devices for health care has been increasingly frequent in recent years. Studies show the immense potential of this technology as an instrument to favor the development of personal and social skills, in the sense of acquiring greater control and decision-making power over health care.

Aim: The objective of this scoping review is to map the mobile health interventions for improving health outcomes in childhood.

Method: This protocol was carried out in according to Joanna Briggs Institute methodology and Preferred checklist Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR), according to the following steps: review question; eligibility criteria (PCC); literature search strategy; study selection; data extraction and data presentation. The review question is: How are mHealth interventions being applied to improve childhood health outcomes (disease prevention, monitoring or diagnosis)? The review will include experimental, quasi-experimental and descriptive observational study designs with quantitative or qualitative approach. Dissertations will be considered, but conference abstracts, posters, editorials, commentaries, and opinion papers will be excluded. The search will be limited to studies published in English, Spanish and Portuguese in the last 10 years. The databases to be searched include PubMed, CINAHL, Embase, Scielo, Web of Science, LILACS, Health System Evidence, and gray literature databases.

Results: The result of the selection flow will be presented in the form of tables and figure, according to PRISMA-ScR.
Conclusion: This study will provide evidence on the development and implementation of online tools to promote children's health.
Keywords: Child-health; biomedical-technology; internet; mobile-health; nursing.

Resumo

INTERVENÇÕES DE SAÚDE MÓVEL PARA MELHORAR OS RESULTADOS DE SAÚDE NA INFÂNCIA: UM PROTOCOLO DE REVISÃO DE ESCOPO

Introdução: O uso de dispositivos móveis para atendimento à saúde tem sido cada vez mais frequente nos últimos anos. Estudos mostram o imenso potencial dessa tecnologia como instrumento para o desenvolvimento de habilidades pessoais e sociais, no sentido de adquirir maior controle e poder de decisão sobre o cuidado à saúde.
Objetivo: Mapear as intervenções móveis de saúde para melhorar os resultados de saúde na infância
Metodologia: A revisão considerará estudos que incluem o uso de dispositivos móveis de saúde por profissionais de saúde ou familiares para cuidar da saúde da criança. Esta revisão de escopo incluirá desenhos de estudos observacionais experimentais, quase experimentais e descritivos com abordagem quantitativa ou qualitativa. Dissertações serão consideradas, mas resumos de conferências, pôsteres, editoriais, comentários e artigos de opinião serão excluídos. A pesquisa será limitada a estudos publicados em inglês, espanhol e português, a partir de 2010. As bases de dados a serem pesquisadas incluem PubMed (MEDLINE), CINAHL (via EBSCO), Embase, PsycINFO (via EBSCO), Scielo, Web of Science, LILACS, Health System Evidence e bancos de dados de literatura cinzenta, como o banco de dados ProQuest Dissertations and Theses Global, OpenGrey, EThOS e PaperFirst. Após a triagem dos resumos/títulos para inclusão por dois pesquisadores independentes, os estudos em texto completo serão selecionados os dados serão extraídos dos artigos incluídos, utilizando o instrumento de extração de dados.
Resultados: Serão apresentados em forma de tabelas e quadros, de acordo com o PRISMA-ScR.
Conclusões: Este estudo fornecerá evidências sobre o desenvolvimento e implementação de ferramentas online de promoção da saúde infantil.
Palavras-chave: Saúde-infantil; tecnología-biomédica; Internet; telemedicina; enfermagem.

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Resumen

INTERVENCIONES MÓVILES DE SALUD PARA MEJORAR LOS RESULTADOS DE SALUD INFANTIL: UN PROTOCOLO DE REVISIÓN DE ALCANCE

Introducción: El uso de dispositivos móviles para el cuidado de la salud ha sido cada vez más frecuente en los últimos años. Los estudios muestran el inmenso potencial de esta tecnología como instrumento para favorecer el desarrollo de habilidades personales y sociales, en el sentido de adquirir un mayor control y poder de decisión sobre la atención de la salud.

Objetivo: El objetivo de esta revisión de alcance es mapear las intervenciones de salud móvil para mejorar los resultados de salud en la infancia.

Método: La revisión considerará estudios que incluyan el uso de la salud móvil por parte de profesionales de la salud o miembros de la familia para cuidar la salud infantil. Esta revisión de alcance incluirá diseños de estudios observacionales experimentales, cuasiexperimentales y descriptivos con un enfoque cuantitativo o cualitativo. Se considerarán disertaciones, pero se excluirán los resúmenes de congresos, carteles, editoriales, comentarios y artículos de opinión. La búsqueda se limitará a los estudios publicados en inglés, español y portugués después de 2010. Las bases de datos que se buscarán incluyen PubMed (MEDLINE), CINAHL (a través de EBSCO), Embase, PsycINFO (a través de EBSCO), Scielo, Web of Science, LILACS, Health System Evidence y bases de datos de literatura gris como la base de datos ProQuest Dissertations and Theses Global, OpenGrey, EThOS y PaperFirst. Después de la selección de resúmenes / títulos para su inclusión por dos investigadores independientes, se seleccionarán los estudios de texto completo y se proporcionarán las razones de la exclusión. Los datos serán extraídos de los artículos incluidos en la revisión por dos investigadores independientes, utilizando el instrumento de extracción de datos.

Resultados: Se presentarán en forma de tablas según PRISMA-ScR.

Conclusiones: Este estudio proporcionará evidencia sobre el desarrollo e implementación de herramientas en línea para promover la salud infantil.

Palabras-clave: Salud-infantil; tecnología-biomédica; Internet; telemedicina; enfermería.

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INTRODUCTION

Child health has shown significant improvements over the last two decades.[1] However, we still face new challenges with the increasing prevalence of non-communicable diseases among children and more recently, with the social isolation imposed by the pandemic.

Mobile Health (mHealth) has played an important role in meeting the population's continuing health needs and has a clear potential to significantly increase the quality and efficiency of healthcare in the digital age, considering that more than four billion people worldwide the world have access to the Internet.[2-3]

In this context, the WHO understands that e-Health is an important tool to achieve Universal Health Coverage and mHealth as a complementary strategy for the achievement of the Sustainable Development Goals, especially in low and middle-income countries.[4] Hence the growing interest in expanding the use of these technologies in care practices and child health care.

Since the 1990s, there has been an increase in the use of e-Health in parallel with the advent of the Internet but with important regional differences that reveal the health needs of the population according to different economic and social contexts[3]. Furthermore, in times of pandemic and social isolation caused by COVID-19, e-Health has become an indispensable tool for health professionals and services.[5-6]

Several studies have provided early evidence of the potential of mobile and wireless technologies for child health, such as interventions in chronic health conditions,[7-8] treatment and improvement of clinical diagnosis[9], treatment adherence,[10-11] promotion of breastfeeding,[12] community interventions,[13] experiences of using mHealth by health professionals,[14-15] among others.

The existing systematic reviews on the use of mHealth in child health care mainly focused on the effectiveness of interventions in pregnancy and postpartum such as those by Lee et al.[16] and Chen et al.,[17] but they did not include any Brazilian study. It appears that no study has yet described how mHealth interventions are being applied to improve childhood health outcomes comprehensively.

A preliminary survey on PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews and the Joanna Briggs Institute Database did not identify any current or ongoing scope reviews on the topic.

Thus, considering that knowledge about the use of the internet and the integration of online tools facilitates the implementation of health interventions[4] and that further research on the use of the internet in child health care is still needed, this study aims is to map the mHealth interventions used to improve childhood health outcomes.

METHODS

The proposed scoping review will be conducted in accordance with the JBI methodology for scoping reviews consisting of the following steps review question; eligibility criteria; literature search strategy; extract, analyze, and discuss the findings; conclusions and discuss the implications for practice and further research.[18]

Review question

How are mHealth interventions being applied to improve childhood health outcomes (disease prevention, monitoring, or diagnosis)?

Eligibility criteria

Eligible articles that will be included in this scope review include studies published in peer-reviewed journals, based on the Population Context, Concept (PCC) strategy criteria for a scoping review. [18]

P-Participants

The review will consider studies that include children from 0 to 12 years of age. Studies involving both children and adolescents together will be excluded.

C-Concept

The concept of interest for the proposed scoping review is 'mobile health' or 'mHealth'. There will be detailed studies on how mHealth is applied for disease prevention, monitoring, or diagnosis. Mobile health or mHealth is a subdivision of e-health and refers to the medical and public health tools and practices supported by mobile devices, such as smartphones, patient monitoring devices, personal digital assistants (PDAs) and others wireless devices.[19]

C-Context

This review will consider studies that assess mHealth interventions for improving health outcomes in childhood in the context of primary health care services, hospitals and home. There will be no geographical limitation applied in relation to this scoping review.

Literature search strategy

This scoping review will consider the following: books and documents, case reports, classical articles, clinical conference, clinical studies, clinical trials, clinical trial protocols, clinical trials phase I, introductory journal articles, journal articles, letters, meta-analyses, multicenter studies, news, newspaper articles, observational studies, randomized controlled trials, reviews, systematic reviews. This review will also consider qualitative studies that evaluated the experience of participants utilizing mHealth for childcare. This review will only encompass studies published in English, Spanish and Portuguese. The review will include studies published in the last 10 years considering the rapid update of the technological area.

The search strategy will follow a JBI three-phase process to identify the original published and unpublished studies. In the first phase, a draft of research will be conducted in PubMed to identify relevant articles on this topic. The text words in the title and abstracts used in the retrieved articles as well as the index terms used to describe the articles were used to develop a full search strategy (Figure 1). In the second research phase, a final research strategy will be adopted for each source of information. The reference lists of all selected studies will be screened for studies during the third phase of the research.

The databases to be searched include PubMed (MEDLINE), CINAHL (via EBSCO), Embase, PsycINFO (via EBSCO), Scielo, Web of Science, LILACS, Health System Evidence. The search for unpublished studies and gray literature will include Scopus and the ProQuest Dissertations and Theses Global database. The authors will also review reference lists for all included studies.

Study selection

Following the search, all identified records will be compiled and uploaded into EndNote (Clarivate Analytics, PA, USA); the duplicates will be removed. Titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant papers will be retrieved in full, and their citation details imported into the Joanna Briggs Institute's System for the Unified Management, Assessment and Review of Information (JBI SUMARI) (The Joanna Briggs Institute, Adelaide, Australia).

The full text of selected citations will be assessed in detail against the inclusion criteria by two independent reviewers. Reasons for exclusion of full

Figure 1.
Search strategy and records retrieved. Pubmed. July, 2021

Search	Query	Records retrieved
#1	Telemedicine AND Child Health AND Primary Health Care AND Nurses AND Health Personnel AND Biomedical Technology AND Health Information Systems AND Mobile Applications AND Information Technology OR Internet	11,529
#2	Telemedicine AND Child Health AND Primary Health Care AND Nurses	42
#3	Telemedicine AND Child Health AND Primary Health Care AND Health Personnel	69
#4	#1 AND #2	08
#5	#1 AND #3	06
#6	#1 AND #2 AND #3	01
Filters applied: Books and Documents, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Clinical Trial Protocol, Clinical Trial, Phase I, Introductory Journal Article, Journal Article, Letter, Meta-Analysis, Multicenter Study, News, Newspaper Article, Observational Study, Randomized Controlled Trial, Review, Systematic Reviews, in the last 10 years, English, Portuguese, Spanish, Child: birth-18 years, Newborn: birth-1 month, Infant: birth-23 months, Infant: 1-23 months, Preschool Child: 2-5 years, Child: 6-12 years, Humans.		

text papers that do not meet the inclusion criteria will be recorded and reported in the scoping review.

Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussion or a third reviewer. The results of the search will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses flow diagram for scoping reviews (PRISMA-ScR).[20]

Data extraction

Data will be extracted from the papers included in the scoping review by two independent reviewers using a data extraction instrument; this instrument will be adapted from the standardized JBI data extraction tool in JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI) (JBI, Adelaide, Australia) to answer the research question.

The data extracted will include specific details about the population, concept, context, study methods and key findings relevant to the review question. Figure 2 displays a draft data extraction tool. The draft data extraction tool will be modified and revised as necessary during the each included paper´s data extraction process. Modifications will be detailed in the full scoping review.

Any disagreements that arise between the reviewers will be resolved through discussion or a third reviewer. The authors of papers will be contacted to request missing or additional data where required.

Data presentation

The extracted data will be presented in diagrammatic or tabular form so that it aligns with the objective of this scoping review. The charting table will report on: the distribution of papers by year of publication, country of origin, study design, number/age/sex of participants, concept (smartphones, patient monitoring devices, personal digital assistants (PDAs) and others wireless devices),

purpose of using the concept (prevention, monitoring or diagnosis), outcomes (diseases, child nutrition, development child, vaccine and others), context (primary health care services, hospitals and the home environment) and the key findings relevant. There will be a narrative summary with the tabulated and/or charted results, and it will describe how the results relate to the review's objective and question.

Figure 2.
Standardized Joanna Briggs Institute data extraction tool.

Author/s, country, year of publication	
Tittle	
Objective/s	
Study design	
Number/Age/Sex of participants	
Concept (smartphones, patient monitoring devices, personal digital assistants (PDAs) and others wireless devices)	
Purpose of using the concept (Prevention, monitoring, or diagnosis)	
Outcomes (diseases, child nutrition, development child, vaccine, and others)	
Context (primary health care services, hospitals, and the home environment)	
Key findings relevant	

RESULTS

The selected studies will be presented descriptively, according to PRISMA-ScR guideline. The extracted data will be presented in tables, along with a narrative summary of the findings.

CONCLUSIONS

Considering the exponential use of Internet in healthcare, this study will provide evidence on the development and implementation of online tools that are being used to promote children's health.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. United Nations Children's Fund. Levels & trends in child mortality: report 2015 estimates developed by the UN Inter-agency Group for Child Mortality Estimation. [Internet]. 2015. (cited 2021 Feb 25). Available from: http://www.childmortality.org/files_v20/download/igme%20report%202015%20child%20mortality%20final.pdf
2. World Health Organization. Connecting for Health Global Vision, Local Insight Report for the World Summit on the Information Society [Internet]. Geneva: World Health Organization; 2005. [cited 2021 Feb 25]. Available from: http://apps.who.int/iris/bitstream/handle/10665/43385/9241593903%20eng.pdf?sequence=1

3. International Telecommunication. Measuring Digital Development. Series of statistical and analytical publications [Internet]. Geneva: International Telecommunication; 2019. [cited 2021 Feb 25]. Available from: https://www.telesintese.com.br/wp-content/uploads/2020/05/ITU_ICTpriceTrends_2019.pdf
4. 4. World Health Organization. mHealth: Use of appropriate digital technologies for public health [Internet]. Geneva: World Health Organization; 2018 [cited 2021 Feb 25]. Available from: https://apps.who.int/iris/handle/10665/274134
5. Caetano R, Silva AB, Guedes ACCM, Paiva CCN, Ribeiro GR, Santos DL, et al. Challenges and opportunities for telehealth during the COVID-19 pandemic: ideas on spaces and initiatives in the Brazilian context. Cad Saude Publica [Internet]. 2020 [cited 2022 March 15];36(5):e00088920. doi: 10.1590/0102-311x00088920
6. Ming LC, Untong N, Aliudin NA. Mobile Health Apps on COVID-19 Launched in the Early Days of the Pandemic: Content Analysis and Review. JMIR Mhealth Uhealth [Internet]. 2020[cited 2022 March 15];8(9): e19796. doi: 10.2196/19796.
7. Prahalad P, Tanenbaum M, Hood K, Maahs DM. Diabetes technology: improving care, improving patient-reported outcomes and preventing complications in young people with Type 1 diabetes. Diabet Med [Internet]. 2018[cited 2022 March 15];35(4):419-429. doi: 10.1111/dme.13588
8. Thabrew H, Stasiak K, Hetrick SE, Wong S, Huss JH, Merry SN. E-Health interventions for anxiety and depression in children and adolescents with long-term physical conditions. Cochrane Database Syst Rev [Internet]. 2018[cited 2022 March 15];8(8):CD012489. doi: 10.1002/14651858.CD012489.pub2
9. Sheikhtaheri A, Kermani F. Telemedicine in Diagnosis, Treatment and Management of Diseases in Children. Stud Health Technol Inform [Internet]. 2018 [cited 2021 Feb 25];248:148-155. PMID: 29726431
10. Santo K, Richtering SS, Chalmers J, Thiagalingam A, Chow CK, Redfern J. Mobile Phone Apps to Improve Medication Adherence: A Systematic Stepwise Process to Identify High-Quality Apps. JMIR Mhealth Uhealth [Internet]. 2016[cited 2022 March 15];4(4):e132. doi: 10.2196/mhealth.6742
11. Jupp JCY, Sultani H, Cooper CA, Peterson KA, Truong TH. Evaluation of mobile phone applications to support medication adherence and symptom management in oncology patients. Pediatr Blood Cancer [Internet]. 2018[cited 2022 March 15];65(11):e27278. doi: 10.1002/pbc.27278
12. Unger JA, Ronen K, Perrier T. Short message service communication improves exclusive breastfeeding and early postpartum contraception in a low- to middle-income country setting: a randomised trial. BJOG [Internet]. 2018[cited 2022 March 15];125(12):1620-1629. doi: 10.1111/1471-0528.15337
13. Mangwi Ayiasi R, Kolsteren P, Batwala V, Criel B, Orach CG. Effect of Village Health Team Home Visits and Mobile Phone Consultations on Maternal and Newborn Care Practices in Masindi and Kiryandongo, Uganda: A Community-Intervention Trial. PLoS One [Internet]. 2016[cited 2022 March 15];11(4):e0153051. doi:10.1371/journal.pone.0153051
14. Odendaal WA, Anstey Watkins J, Leon N. Health workers' perceptions and experiences of using mHealth technologies to deliver primary healthcare services: a qualitative evidence synthesis. Cochrane Database Syst Rev [Internet].

2020[cited 2022 March 15];3(3):CD011942. doi: 10.1002/14651858.CD011942.pub2
15. Schoen J, Mallett JW, Grossman-Kahn R, Brentani A, Kaselitz E, Heisler M. Perspectives and experiences of community health workers in Brazilian primary care centers using m-health tools in home visits with community members. Hum Resour Health [Internet]. 2017[cited 2022 March 15];15(1):71. doi: 10.1186/s12960-017-0245-9
16. Lee SH, Nurmatov UB, Nwaru BI, Mukherjee M, Grant L, Pagliari C. Effectiveness of mHealth interventions for maternal, newborn and child health in low- and middle-income countries: Systematic review and meta-analysis. J Glob Health [Internet]. 2016[cited 2022 March 15]; 6(1):010401. doi: 10.7189/jogh.06.010401
17. Chen H, Chai Y, Dong L, Niu W, Zhang P. Effectiveness and appropriateness of mHealth interventions for maternal and child health: systematic review. JMIR [Internet]. 2018 Jan 9[cited 2022 March 15];6(1):e7. doi: 10.2196/mhealth.8998
18. Peters MC, Godfrey MC, Pharm HK, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. Int J Evid Based Health [Internet]. 2015[cited 2022 March 15]; 13:141–146. doi: 10.1097/XEB.0000000000000050
19. Veiga J, Rodriguez JP, Trevizan B, Rebonatto MT, De Marchi ACB. Mobile applications with doctor-patient interaction for a healthy lifestyle: a systematic review. RECIIS – RevEletronComunInfInov Saúde. 2017;11(1). doi: 10.29397/reciis.v11i1.1188
20. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med [Internet]. 2018[cited 2022 March 15]; 169 (7):467-473. doi:10.7326/M18-0850.