

INPLASY

Impact of interdisciplinary digital interventions in the treatment of metabolic syndrome: A scoping review

INPLASY2025100068

doi: 10.37766/inplasy2025.10.0068

Received: 19 October 2025

Published: 19 October 2025

Velazquez-Moreno, E; Jiménez-Mendoza, A; Moreno-Velazquez, XS; Chávez-Juárez, JE; Ramírez-Arvizu, I.

Corresponding author:

Eduardo Velazquez-Moreno

eduardovemo3@gmail.com

Author Affiliation:

Sistema Educativo de Ciencias
Médicas AC / Universidad ICEL.

ADMINISTRATIVE INFORMATION

Support - Funded by the authors.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025100068

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 October 2025 and was last updated on 19 October 2025.

INTRODUCTION

Review question / Objective Objective: To determine the scope and nature of the existing literature on the impact of interdisciplinary digital interventions in the treatment of metabolic syndrome.

Background Metabolic Syndrome (MS) is defined as a cluster of interrelated conditions that include central obesity, hypertension, atherogenic dyslipidemia, and impaired glucose homeostasis. Its presence significantly increases the risk of developing cardiovascular disease (CVD) and type 2 diabetes mellitus (T2DM), making it a critical global public health challenge. Despite advances in pharmacology, the cornerstone of MS treatment remains intensive and sustained lifestyle modification, encompassing dietary changes, increased physical activity, and stress management.

The multifactorial nature of MS requires a holistic and interdisciplinary treatment approach (II).

Structured collaboration among diverse healthcare professionals, such as physicians, dietitians, diabetes educators, physical therapists, and psychologists, has been shown to be crucial in addressing the various components of the syndrome and promoting long-term adherence to lifestyle guidelines. However, the implementation of these intensive and coordinated models is often limited by logistical, geographical, and cost barriers, which restrict their scalability and accessibility in routine clinical settings.

In this context, digital interventions (DIs) have emerged as an innovative and promising tool to overcome these limitations. Mobile health (mHealth) technologies, telemonitoring platforms, wearables, and personalized apps offer mechanisms for real-time data collection, immediate feedback, ongoing education, and behavioral support. These digital tools have the potential to extend the reach of treatment beyond the clinic, facilitating self-management and remote monitoring.

There is growing, but fragmented, evidence on the effectiveness of both interdisciplinary approaches and individual digital interventions in chronic disease management. However, the formal and systematic articulation of digital interventions designed and implemented by interdisciplinary teams for the specific treatment of Metabolic Syndrome represents a relatively recent area of research. It is critical to understand how these two key elements are being integrated, what care models are being explored, and what the most common digital components and equipment configurations are being used in clinical practice and research.

Rationale Effective treatment of Metabolic Syndrome requires a synergy of knowledge and ongoing monitoring, demands ideally met through interdisciplinarity and technology. While the value of interdisciplinary interventions is recognized and the usefulness of digital tools is undeniable, the current literature lacks an overview that maps the convergence of these two areas specifically for MetS. This scoping review is justified by the pressing need to clarify this emerging landscape. First, it is justified by the need to map the research field. The scoping review will identify and categorize the breadth and nature of existing evidence on the design, implementation, and outcomes of interventions that combine digital components with input from two or more disciplines for the management of MetS. This will provide a necessary taxonomic structure for organizing current knowledge. Second, it is justified by its usefulness for clinical practice and decision-making. By identifying the types of digital tools used (e.g., telemedicine, apps, virtual coaching), the specific configurations of interdisciplinary teams (e.g., physician-dietitian-psychologist), and the reported outcomes (e.g., weight loss, glycemic control, adherence), the review will provide valuable information for health program developers and policymakers. It will be able to highlight which combinations or models have shown promise or which require further research. Third, its justification lies in identifying knowledge gaps. This methodology is optimal for highlighting research gaps, especially in terms of underrepresented populations (e.g., specific ethnic groups, rural areas), the long-term sustainability of interventions, or cost-effectiveness. By delineating where and how this topic has been investigated, the review will guide the agenda for future research, suggesting areas for high-quality randomized controlled clinical trials and implementation studies. In summary, this scoping review will not only synthesize current knowledge

but also establish a conceptual and practical foundation for optimizing the design and delivery of modern, scalable, and truly comprehensive healthcare models for the millions of people affected by Metabolic Syndrome worldwide.

METHODS

Strategy of data synthesis Key terms, extracted from DeCS/MeSH, include:

- Digital health
- Metabolic syndrome
- Digital media
- Intervention studies
- Interdisciplinary research

The search will be conducted in the following databases and platforms:

- Pubmed
- Scielo
- BVS (Virtual Health Library)
- Google Scholar
- Medigraphic
- Imbiomed
- Cochrane

• TesisUNAMA scoping review was designed following the PRISMA-ScR (Preferred Reporting Items Systemic Reviews and Meta-analyses Scoping Reviews) methodology. The protocol was retrospectively registered in INPLASY. Key search terms, extracted from the DeCS/MeSH thesaurus, included: Digital health, metabolic syndrome, digital media, intervention studies, and interdisciplinary research. For inclusion, articles from peer-reviewed journals had to measure or focus on the impact of digital and interdisciplinary educational interventions in the treatment of MS. Studies published between 2020 and 2025 in Spanish, English, and Portuguese were considered. Articles that do not align with the conceptual framework of the study, such as those focused on diagnosis or pure epidemiology without an intervention component, were excluded. The search will be conducted from November 1 to January 31, 2025, in databases such as Pubmed, Scielo, BVS, Google Scholar, Medigraphic, Imbiomed, Cochrane, and TesisUNAM.

Eligibility criteria Participants: No specific participant type applies, as the review focuses on interventions. However, studies must involve populations with Metabolic Syndrome (MS).

Concept (Review Focus): Impact of digital and interdisciplinary educational interventions in the treatment of Metabolic Syndrome (MS). Articles that measure or focus on this impact will be included.

Context: Interventions delivered in a Digital Health setting or through the use of digital media.

Source of evidence screening and selection

The selection process will follow a two-stage approach, following the PRISMA-ScR methodology:

1. Title and Abstract Screening Stage: Two reviewers will independently examine the titles and abstracts of the identified sources to assess their potential eligibility based on the inclusion and exclusion criteria.

2. Full-Text Assessment Stage: Sources that pass the first stage will be reviewed in full text by the two reviewers independently.

Resolution of Disagreements: Any disagreement between the two reviewers at any stage (screening or full text) will be resolved through discussion until a consensus is reached. If consensus is not possible, a third independent reviewer will be consulted to make the final decision.

Data management Data from the included studies (e.g., authors, year of publication, country, study design, type of digital intervention, population, key outcomes, and findings relevant to the objective) will be extracted using a predesigned, standardized data extraction form. Data will be recorded in an electronic spreadsheet (e.g., Excel or Google Sheets). One reviewer will extract the data, and a second reviewer will check a subsample of the extraction to ensure accuracy.

Reporting results / Analysis of the evidence A narrative synthesis approach will be used to group and describe the findings. The analysis will focus on:

1. Identifying the nature of the evidence: What types of studies are being conducted?
2. Mapping the key characteristics of digital and interdisciplinary interventions: How are they designed and implemented?
3. Summarizing the main outcomes/impacts of these interventions in the treatment of Metabolic Syndrome.
4. Identifying existing research gaps in the field.

Presentation of the results The results will be presented in a clear and detailed manner, including:

- PRISMA-ScR Flowchart: To document the evidence source selection process.
- Charting Tables: To present key characteristics of the included sources (e.g., author, year, country, objective, design, participants, characteristics of the digital intervention).
- Graphs/Figures: To visualize key demographic or conceptual characteristics of the interventions

(e.g., distribution by type of digital technology or by country of origin).

• Narrative Synthesis: To discuss and contextualize the findings and their implications for practice and research.

Language restriction The search will be limited to articles published in the following languages: Spanish, English and Portuguese.

Country(ies) involved Mexico - Sistema Educativo de Ciencias Médicas AC / Universidad ICEL.

Other relevant information Search Period: The search will be conducted from November 1st to January 31st, 2025.

Specific Exclusion Criteria: Articles that do not align with the conceptual framework, such as those focused solely on diagnosis or pure epidemiology without an intervention component.

Keywords Digital health, Metabolic syndrome, Scoping review, Educational intervention, Interdisciplinary, Digital media, Treatment.

Dissemination plans The results of this review will be published in a regional nursing journal (Americas).

Contributions of each author

Author 1 - Eduardo Velazquez-Moreno - Protocol Conceptualization, Protocol Design, Search Strategy Development.

Email: eduardovemo3@gmail.com

Author 2 - Araceli Jiménez-Mendoza - Protocol Design, Search Strategy Development.

Email: ajimenez55070@gmail.com

Author 3 - Xochitl Sarahi Moreno-Velázquez - Protocol Conceptualization, Protocol Design.

Email: xoch.moreno07@gmail.com

Author 4 - José Eduardo Chávez-Júarez - Search Strategy Development.

Email: enfermerochavezjuarez@gmail.com

Author 5 - Israel Ramírez-Arvizu - Protocol Design.

Email: babe5518@hotmail.com