

Adherence to Pharmacological Treatment and Non-Pharmacological Therapies in the Management of Type 2 Diabetes Mellitus: A Scoping Review

Adesão a tratamento medicamentoso e terapias não farmacológicas no controle do diabetes mellitus tipo 2: uma revisão de escopo

Adhesión al Tratamiento Farmacológico y a las Terapias No Farmacológicas en el Control de la Diabetes Mellitus Tipo 2: Una Revisión de Alcance

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Abstract

Introduction: Type 2 Diabetes Mellitus (T2DM) represents one of the major global public health challenges, requiring continuous therapeutic strategies that include both pharmacological and non-pharmacological interventions. Treatment adherence is crucial for glycemic control and the prevention of complications, yet it remains hindered by multiple barriers. **Objective:** To map the available evidence on adherence to pharmacological or non-pharmacological treatments in the management of T2DM, identifying facilitators, barriers, and research gaps. **Methods:** A scoping review was conducted following guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) and the Joanna Briggs Institute, registered with the Open Science Framework. Studies published between 2014 and 2024 were included, sourced from PubMed/MEDLINE, LILACS, and ClinicalTrials.gov, in Portuguese, Spanish, and English. The search strategy combined descriptors related to T2DM, adherence, pharmacological treatment, and non-pharmacological therapies. Clinical trials, observational studies, systematic reviews, and cohort studies were included. Thematic analysis guided the categorization of findings. **Results:** A total of 16 studies were included. We identified four main thematic categories by the synthesis: (I) barriers to adherence, such as polypharmacy, depressive symptoms, and resistance to insulin use; (II) facilitators, such as social support and health education strategies; (III) digital technologies, including reminders and self-care applications (reported in fewer studies); and (IV) adherence assessment tools such as the Medication Adherence Test. There was a predominance of Brazilian studies, lack of standardized indicators, and a scarcity of longitudinal research. **Conclusions:** Adherence to T2DM treatment remains a multifactorial phenomenon, requiring interdisciplinary approaches. The use of technologies seems promising, but still lacks validation and standardization. Health education- and social support-based interventions demonstrated greater applicability. Future research should explore diverse populations and adopt consistent indicators, in alignment with the Sustainable Development Goals, particularly regarding equitable access and the promotion of self-care.

Keywords: Diabetes mellitus; Scoping review; Patient compliance; Public health; Self-care.

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Resumo

Introdução: O Diabetes Mellitus tipo 2 (DM2) representa um dos principais desafios globais de saúde pública, exigindo estratégias terapêuticas contínuas que envolvam intervenções medicamentosas e não medicamentosas. A adesão ao tratamento é determinante para o controle glicêmico e a prevenção de complicações, mas ainda é comprometida por múltiplas barreiras. **Objetivo:** Mapear as evidências disponíveis sobre a adesão a tratamento medicamentoso e terapias não farmacológicas no controle do DM2, identificando fatores facilitadores, barreiras e lacunas de pesquisa. **Métodos:** Revisão de escopo conduzida com base nas diretrizes *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews* (PRISMA-ScR) e Joanna Briggs Institute, registrada no *Open Science Framework*. Foram incluídos estudos publicados entre 2014 e 2024 nas bases *PubMed/Medical Literature Analysis and Retrieval System Online* (MEDLINE), Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS) e *ClinicalTrials.gov*, nos idiomas português, espanhol e inglês. A busca combinou descritores relacionados a DM2, adesão, tratamento medicamentoso e terapias não farmacológicas. Foram considerados ensaios clínicos, estudos observacionais, revisões sistemáticas e coortes. A análise temática orientou a categorização dos resultados. **Resultados:** Foram incluídos 16 estudos. A síntese evidenciou 4 categorias principais: (I) barreiras à adesão, como polifarmácia, sintomas depressivos e resistência ao uso da insulina; (II) fatores facilitadores, como suporte social e estratégias de educação em saúde; (III) tecnologias digitais, como lembretes e aplicativos de autocuidado (relatados em menor número); e (IV) instrumentos de avaliação da adesão, como o *Medication Adherence Test* (MAT). Observou-se predominância de estudos brasileiros, ausência de padronização nos indicadores utilizados e escassez de investigações longitudinais. **Conclusões:** A adesão ao tratamento do DM2 continua sendo um fenômeno multifatorial, exigindo abordagens interdisciplinares. O uso de tecnologias pode ser promissor, mas ainda carece de validação e padronização. Intervenções baseadas em educação em saúde e apoio social demonstraram maior aplicabilidade. Futuras pesquisas devem explorar populações diversas e incluir indicadores consistentes, alinhando-se aos Objetivos de Desenvolvimento Sustentável (ODS), especialmente no que se refere ao acesso equitativo e à promoção do autocuidado.

Palavras-chave: Diabetes mellitus; Revisão de escopo; Cooperação do paciente; Saúde pública; Autocuidado.

Resumen

Introducción: La Diabetes Mellitus tipo 2 (DM2) representa uno de los principales desafíos de salud pública a nivel mundial, lo que exige estrategias terapéuticas continuas que incluyan intervenciones farmacológicas y no farmacológicas. La adhesión al tratamiento es fundamental para el control glucémico y la prevención de complicaciones, pero aún se ve afectada por múltiples barreras. **Objetivo:** Mapear la evidencia disponible sobre la adhesión al tratamiento farmacológico o no farmacológico en el control de la DM2, identificando factores facilitadores, barreras y vacíos en la investigación. **Métodos:** Revisión de alcance realizada conforme a las directrices PRISMA-ScR y del Instituto Joanna Briggs, registrada en el Open Science Framework. Se incluyeron estudios publicados entre 2014 y 2024, extraídos de PubMed/MEDLINE, LILACS y ClinicalTrials.gov, en portugués, español e inglés. La búsqueda combinó descriptores relacionados con DM2, adherencia, tratamiento farmacológico y terapias no farmacológicas. Se consideraron ensayos clínicos, estudios observacionales, revisiones sistemáticas y estudios de cohorte. El análisis temático guió la categorización de los resultados. **Resultados:** Se incluyeron 16 estudios. La síntesis reveló cuatro categorías principales: (I) barreras para la adhesión, como polifarmacia, síntomas depresivos y resistencia al uso de insulina; (II) factores facilitadores, como apoyo social y estrategias de educación en salud; (III) tecnologías digitales, como recordatorios y aplicaciones de autocuidado (reportadas en menor número); y (IV) herramientas de evaluación de la adherencia, como el *Medication Adherence Test* (MAT). Se observó una predominancia de estudios brasileños, falta de estandarización en los indicadores utilizados y escasez de investigaciones longitudinales. **Conclusiones:** La adhesión al tratamiento de la DM2 sigue siendo un fenómeno multifactorial que exige enfoques interdisciplinarios. El uso de tecnologías puede ser prometedor, pero aún carece de validación y estandarización. Las intervenciones basadas en educación en salud y apoyo social mostraron mayor aplicabilidad. Se recomienda que futuras investigaciones aborden poblaciones diversas y utilicen indicadores consistentes, en consonancia con los Objetivos de Desarrollo Sostenible (ODS), especialmente en lo que respecta al acceso equitativo y la promoción del autocuidado.

Palabras clave: Diabetes mellitus; Revisión de alcance; Cooperación del paciente; Salud pública; Autocuidado.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a chronic and progressive condition that affects millions of people worldwide, representing a significant challenge for both health systems and affected individuals. Unlike other forms of diabetes, such as type 1, T2DM is often associated with factors such as obesity, sedentary lifestyle, and genetics, and is not typically classified as an autoimmune disease.¹

In 2023, according to new data from the International Diabetes Federation (IDF) Diabetes Atlas, approximately 540 million adults (ages 20-79) live with diabetes worldwide.² This figure is expected to significantly increase, reaching 643 million by 2030 and 783 million by 2045, driven by factors such as

increased obesity rates, aging population, and decreasing levels of physical activity. It is worth noting that about 44.7% of people with diabetes are not diagnosed.^{2,3}

In Brazil, the estimated number of people living with diabetes increased to about 15.7 million, reflecting the broader global increasing trend of the disease prevalence. The diabetes rate in the country accounts for about 7 to 9% of the population.³

The treatment of T2DM involves a combination of drug interventions such as the use of oral antidiabetic drugs and insulin. In addition, new therapeutic drug classes have been incorporated into the clinical guidelines, especially glucagon-like peptide-1 (GLP-1) receptor agonists, such as semaglutide and liraglutide, which are subcutaneously administered and have demonstrated benefits in glycemic control, weight loss, and reduction of cardiovascular risk in patients with T2DM^{4,5,6}; and non-pharmacological interventions, which include dietary changes and increased physical activity.⁷ Despite the pharmacological advances and the introduction of new therapeutic drug classes, the clinical efficacy of these interventions remains directly dependent on the patient's behavior in relation to prescription. Within this context, adherence to treatment is a crucial factor for the effective glycemic control and to prevent severe complications such as cardiovascular diseases, neuropathy, and diabetic retinopathy. Vicente et al. (2018)⁸ point out that success in diabetes management significantly depends on patient engagement and continuous support by multidisciplinary health teams.

Furthermore, it is essential that health professionals understand the various signs and symptoms of the disease and the barriers faced by patients in adherence to the prescribed treatment.⁹ Researchers indicate that a patient-centered approach, which considers their experiences and individual challenges, can significantly improve clinical outcomes.¹⁰

In this scoping review, we aim to synthesize studies available in the literature on adherence to pharmacological and non-pharmacological therapies in the control of T2DM, in addition to mapping gaps and exploring future research opportunities in this vital area.

METHODS

This scoping review was developed according to the guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-SCR)¹¹ and the recommendations of the Joanna Briggs Institute (JBI). Scoping review is a type of knowledge synthesis that seeks to map key concepts, available evidence, and research gaps in a given thematic area, differing from the systematic review for not evaluating the methodological quality of the included studies.¹² The study was registered in the Open Science Framework, available at https://osf.io/zmbnh/?view_only=79a2b6cc06f94dd988eec2cb73e5ac1a, ensuring transparency and reproducibility.

The guiding question was structured based on the PCC (population, concept, context) model, where: P = people with T2DM; C = adherence to treatment; and C = pharmacological and non-pharmacological treatment.

Guiding question: What are the pieces of evidence on adherence to treatments available for T2DM? Searches were conducted on October 2, 2024, covering publications from April 2014 to October 2024; the included languages were English, Spanish, and Portuguese. The considered databases include PubMed/Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Health Sciences Literature (LILACS), and ClinicalTrials.gov. The search terms were derived from the Medical Subject Headings (MeSH) and Health Sciences Descriptors (DeCS), including "Type II Diabetes Mellitus,"

“Adherence to treatment of Type II Diabetes,” “Drug therapy for Type II Diabetes,” and “Therapies for the treatment of Type II Diabetes.”

The search strategy was designed to balance the specificity of robust evidence with the need to map the healthcare scenario. In PubMed, the use of controlled descriptors (MeSH) combined with metadata filters for “Clinical Trial,” “Randomized Controlled Trial,” and “Review” were prioritized, aiming to identify tested interventions. For PubMed, the following combination was used: (“Type 2 Diabetes Mellitus” [Mesh] OR “Diabetes Mellitus, Type 2”) AND (“Medication Adherence” [Mesh] OR “Patient Compliance” [Mesh] OR “Therapeutic Adherence”) AND (“Drug Therapy” [Mesh] OR “Non-Pharmacological Therapies” OR “Self-Management”).

However, given the nature of the scoping review and the importance of real-world data, observational and cross-sectional studies — especially retrieved from the LILACS database and manual search — that met the inclusion criteria and brought relevant data on barriers and adherence behaviors in the context of Primary Health Care were kept in the final selection. This mixed approach allowed to compose an overview that combines the effectiveness of interventions (trials) with the reality of health care (observational studies).

Filters were applied for the period from 2014 to April 2024 and for English, Spanish, and Portuguese. For the LILACS database, we used: (“*Diabetes Mellitus Tipo 2*” OR “*Diabetes Mellitus, Tipo 2*”) AND (“*Adesão ao Tratamento*” OR “*Cumprimento do Tratamento*” OR “*Adesão Terapêutica*”) AND (“*Tratamento Farmacológico*” OR “*Tratamento Não Farmacológico*” OR “*Autogestão*”). In turn, in ClinicalTrials.gov, the search filtered by studies of the type “Interventional Studies,” with “Completed” or “Ongoing” status and with available results. The *Rayyan*[®] software was used to facilitate the selection of studies.

Inclusion criteria

Studies on adults with T2DM; research addressing pharmacological or non-pharmacological treatments for T2DM, studies discussing adherence to treatment, including drug therapy (e.g., use of hypoglycemic agents, insulin) or not (e.g., exercise, diet). Moreover, studies that report treatment adherence indicators — such as improvement in health outcomes, glycemic control (HbA1c) — or patient self-management that include clinical trials, cohort studies, systematic reviews, and observational studies. Initially, filters were used by study design in the databases (such as “Clinical Trial”, “Randomized Controlled Trial,” and “Review”) in order to prioritize studies with robust designs. However, during manual screening, some relevant observational studies were also included, which met the inclusion criteria, according to the review team’s evaluation. This methodological flexibilization was adopted to ensure the scoping review, a characteristic recommended for this type of synthesis. Finally, publications between 2014 and 2024, in English, Portuguese, and Spanish, were considered.

Exclusion criteria

Studies on pediatric patients or individuals with other types of diabetes (e.g., type 1 or gestational), research that does not address treatment or adherence (e.g., psychological or economic factors alone), studies that do not assess adherence or discuss only complications unrelated to treatment. Case studies, opinions or editorials, research that did not include primary data, and literature reviews without objective methodology were excluded.

Two independent reviewers evaluated the studies for inclusion, and divergences were resolved by consensus. Data were extracted following a standardized form previously tested by the review team.

The information extracted included title, DOI, author(s), year of publication, objective, study design, and results related to adherence to treatment.

The results were synthesized in a descriptive way, focusing on how the evidence addresses adherence to pharmacological and non-pharmacological treatments for T2DM. A thematic analysis was carried out to identify patterns and gaps in the available evidence.

RESULTS

In Figure 1, we show the flowchart gathering the stages of the study selection process for a review. The search in the databases resulted in 166 records: PubMed/MEDLINE (n=114), LILACS (n=35), and ClinicalTrials.gov (n=17). After excluding seven duplicates, 159 studies were considered for initial screening.

In the reading of titles and abstracts stage, 136 studies were excluded because they did not meet the inclusion criteria. The remaining 23 were evaluated in full, and seven were excluded because they did not deal directly with treatment adherence or because they did not present primary data. Thus, 16 studies were included in the scoping review.

It should be noted that, although the initial filters in the databases have prioritized clinical trials and reviews, the review team has also chosen to include some observational studies, as long as they meet the defined criteria. This decision follows the methodological guidelines for scoping reviews, which recommend an inclusive and flexible approach to map the existing body of evidence. We identified a total of 16 studies in the scoping review (Chart 1), which address diverse aspects of adherence to pharmacological and non-pharmacological treatment in T2DM.

Based on the thematic analysis of the findings, the results were organized into four main categories:

- I. barriers to adherence;
- II. facilitators;
- III. digital technologies for care support; and
- IV. adherence assessment tools.

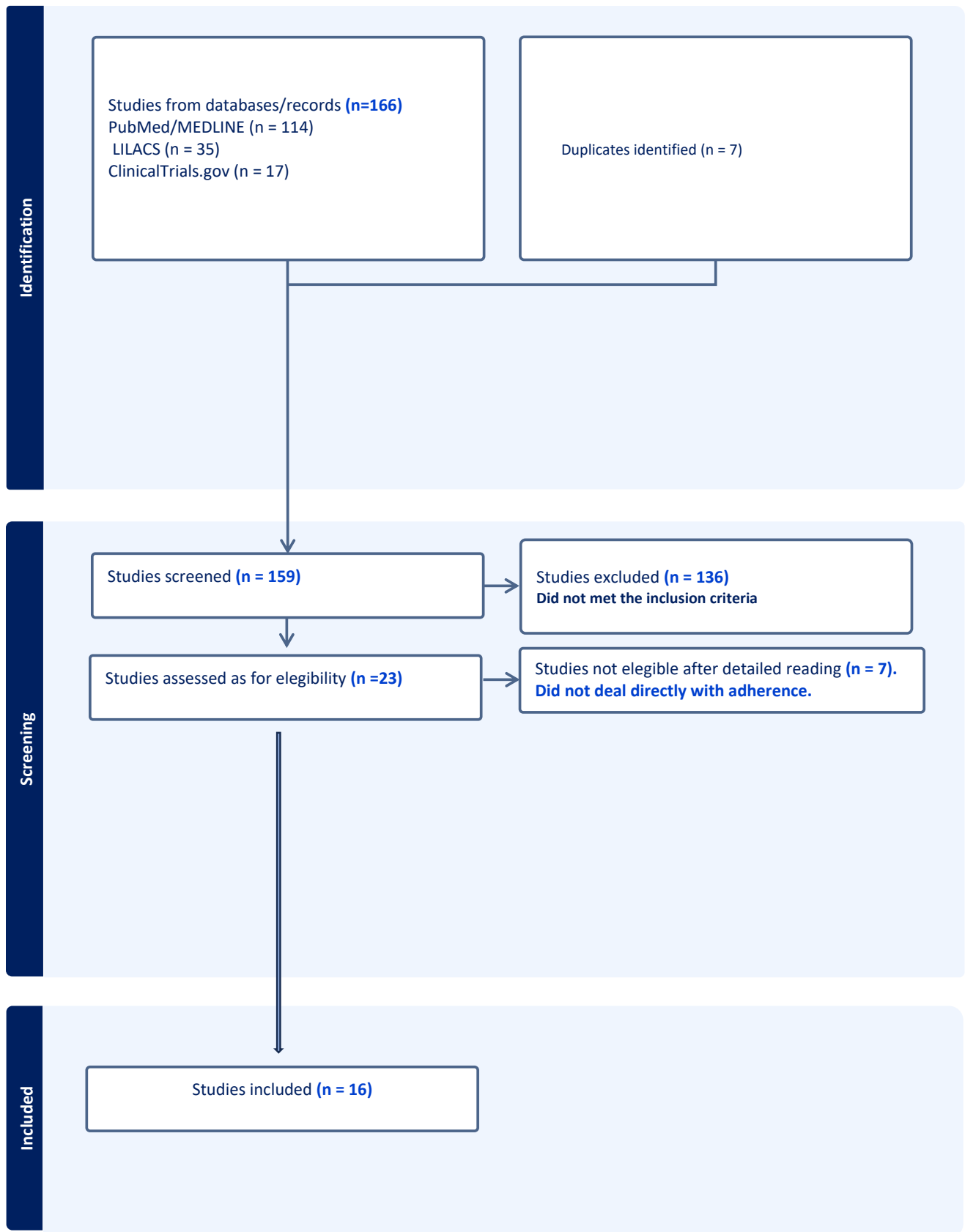
I. Barriers to adherence

Factors that hinder adherence to treatment were recurrent in several studies. Difficulties with complex schedules and therapeutic regimens were reported by patients in different contexts.^{19,24} The presence of depressive symptoms, in turn, was associated with worse adherence, even among patients who reported to follow the treatment.²⁵ Another important element is the negative beliefs about insulin use, which still generate resistance and impact on treatment continuity.²⁶

In addition, polypharmacy, lack of motivation, and diet complexity were identified as frequent barriers in narrative reviews and cross-sectional studies.²⁸ Considering these findings, even in view of therapeutic availability, multiple obstacles continue to compromise effective adherence to treatment.

II. Facilitators

Authors of some studies have highlighted conditions that favor adherence such as social support, patient empowerment, and health education. In a randomized clinical trial, Macedo et al. (2017)¹³ observed that group education provided significant improvements in glycated hemoglobin levels and patient



Source: Original research data.

Figure 1. PRISMA flowchart.

Chart 1. Studies found on adherence to treatment of type 2 diabetes mellitus.

Title	Author/Year/DOI	Objective	Study design	Results
<i>Adesão e empoderamento de usuários com diabetes mellitus para práticas de autocuidado: ensaio clínico randomizado</i> [Adherence and empowerment of users with diabetes mellitus for self-care practices: Randomized clinical trial]	Macedo et al., 2017 ¹³	To evaluate the adherence and empowerment of the user with diabetes mellitus for self-care practices and glycemic control in group education.	Randomized clinical trial	183 users participated in the study, 72 in the intervention group and 111 in the control group. There was a statistically significant reduction in the values of glycated hemoglobin and an increase in the scores of adherence to self-care and empowerment for the participants of the intervention group.
<i>Associação entre a adesão terapêutica e o controle glicêmico de pacientes com diabetes mellitus tipo 2</i> [Association between therapeutic adherence and glycemic control of patients with type 2 diabetes mellitus]	Mendonça et al., 2023 ¹⁴	To evaluate the association between adherence to pharmacological treatment and glycemic control of type 2 diabetic patients and to investigate factors associated with these conditions.	Cross-sectional observational study	Therapeutic adherence was demonstrated by 78.4% of patients, with positive association with level of education and negative association with age and diagnosis time. Glycemic control was verified by 68.7% of the patients. Among adherents, 77.1% had adequate glycemic control, while among the non-adherents, 37.9% were considered controlled.
<i>Impacto de informação escrita no controle e adesão no DM2</i> [Impact of written information on control and adherence in T2DM]	Caetano et al., 2018 ¹⁵	To evaluate the effectiveness of information leaflets in adherence and glycemic control among patients with T2DM after six months.	Non-pharmacological clinical trial	Adherence to medication improved significantly in the leaflet group, especially in patients under 65 years of age.
<i>Controle metabólico e adesão medicamentosa em pessoas com DM2</i> [Metabolic control and drug adherence in people with T2DM]	Lira Neto et al., 2017 ¹⁶	To relate adherence to oral antidiabetic medications with metabolic control in patients with T2DM.	Analytical study	23.9% of the participants were adherent; these showed better levels of HbA1c, fasting blood glucose, and total cholesterol.
Medication therapy management (MTM): an innovative approach to improve medication adherence in diabetics	Murali et al., 2016 ¹⁷	To Implement a Medication Therapy Management (MTM) program to improve drug adherence in patients with T2DM.	Prospective intervention study	Adherence to treatment significantly increased after the intervention led by pharmacists, especially in younger patients.
Associations between having an informal caregiver, social support, and self-care among low-income adults with poorly controlled diabetes	Bouldin et al., 2017 ¹⁸	To evaluate the impact of informal caregivers and social support on self-care in adults with poorly-controlled diabetes.	Cross-sectional study	Presence of informal caregivers and greater social support are associated with greater drug adherence and self-care.

Continue...

Chart 1. Continuation.

Title	Author/Year/DOI	Objective	Study design	Results
<i>Adesão ao tratamento medicamentoso entre pessoas com DM2</i> [Adherence to drug treatment among people with T2DM]	Rossi et al., 2015 ¹⁹	To evaluate adherence to drug treatment among people with T2DM in a city on the outskirts of the state of Minas Gerais, Brazil.	Descriptive cross-sectional study	About 41.5% of the participants reported difficulties with medication schedules, indicating challenges in adherence.
Mediators and Moderators of Improvements in Medication Adherence	Hofer et al., 2016 ²⁰	To investigate mediating and moderating factors in adherence to treatment with support of community workers.	Randomized clinical trial	Improved satisfaction with medication information was associated with better adherence, without significant increase in self-efficacy.
Latinos understanding the need for adherence in diabetes (LUNA-D)	Talavera et al., 2021 ²¹	To test an integrated model of care to improve glycemic control and adherence among Latinos with diabetes.	Pragmatic randomized clinical trial	The integrated intervention was effective in improving HbA1c and blood pressure among Latinos with T2DM.
Perceptions and experiences of taking oral medications for Type 2 diabetes	McSharry et al., 2016 ²²	To investigate patients' perceptions of oral medication use for T2DM.	Systematic review and meta-synthesis	Many patients see medicines as a "necessary evil," adjusting usage to personal preferences.
<i>Adesão à terapêutica medicamentosa e fatores associados em DM2</i> [Adherence to drug therapy and associated factors in T2DM]	Botrel et al., 2021 ²³	To evaluate adherence and associated factors in patients with T2DM.	Cross-sectional observational study	Adherence was estimated at 84.2% by the Medication Adherence Test (MAT), with higher adherence among patients with polypharmacy and age less 60 years.
Prevalence of adherence to pharmacological treatment in patients with type 2 diabetes mellitus	Vicenzi and Moehlecke, 2018 ²⁴	To determine prevalence and obstacles to adherence to pharmacological treatment in patients with T2DM.	Cross-sectional study	Adherence was low (49%), with greater difficulties due to lack of motivation and diet complexity.
<i>Qualidade de vida, depressão e adesão ao tratamento de pessoas com DM2</i> [Quality of life, depression, and adherence to treatment of people with T2DM]	Ramos et al., 2017 ²⁵	To evaluate quality of life, depression, and adherence to treatment of people with T2DM.	Descriptive exploratory study	94.7% adhered to the treatment, but presented emotional problems and depressive symptoms.
<i>Crenças relacionadas ao uso de insulina em pessoas com DM2</i> [Beliefs related to insulin use in people with T2DM]	Gouveia et al., 2020 ²⁶	To identify beliefs about insulin use in people with T2DM.	Descriptive cross-sectional study	Participants expressed positive and negative beliefs about insulin use, impacting their adherence to treatment.
A pilot study of a Community Health Agent-led type 2 diabetes self-management program	Nascimento et al., 2017 ²⁷	To test a self-management program for T2DM led by Community Health Agents in Brazil.	Pilot study	There was an improvement in the quality of care and self-management, with reductions in LDL and triglycerides.
Understanding adherence to medications in type 2 diabetes care and clinical trials	Tiktin et al., 2015 ²⁸	Narrative review to identify factors that affect adherence to drug treatment in T2DM.	Narrative review	Adherence is impacted by factors such as depression, polypharmacy, and convenience; patient motivation and education are crucial to improve adherence.

Source: Original research data.

engagement with self-care. Bouldin et al. (2017)¹⁸ also identified that the support of informal caregivers and social media is associated with better levels of adherence to pharmacological treatment.

High level of education,¹⁴ the use of integrated care strategies,²¹ and pharmacological follow-up interventions¹⁶ were also promising. Botrel et al. (2021)²³ point to greater adherence among patients with polypharmacy and age less than 60 years.

III. Digital technologies for care support

Although less represented in the sample, some researchers investigated digital and educational interventions aimed at self-care. Bindu Murali et al. (2016)¹⁷ showed that pharmaceutical-led programs significantly increased adherence to treatment. Caetano et al. (2018)¹⁵ showed the effectiveness of simple information leaflets to improve adherence, especially in patients under 65 years of age.

Other researchers highlighted the use of community support mediated by technology or strategies organized by Community Health Agents, with a positive impact on clinical indicators such as LDL, triglycerides, and self-management.^{27,20}

IV. Adherence assessment tools

Lastly, some authors focused on measuring adherence through validated instruments or theoretical reviews. Botrel et al. (2021)²³ used the Medication Adherence Test (MAT), estimating a global adherence of 84.2% in the studied population. In turn, McSharry et al. (2016)²², through a qualitative meta-synthesis, showed ambivalent perceptions of patients about the continuous use of medicines — many consider them a “necessary evil,” adjusting the use according to personal preferences and without professional guidance.

DISCUSSION

The findings of this scoping review show that adherence to the treatment of T2DM remains a multifactorial challenge, permeated by clinical, emotional, social, and structural components. The four thematic categories identified — barriers to adherence, facilitators, digital technologies for care support, and adherence assessment tools — demonstrate a broad and complex panorama, requiring interdisciplinary and sensitive approaches to patients' context.

The most frequently identified barriers concern the complexity of therapeutic regimens^{24,28}; side effects of medications²²; presence of depressive symptoms; and negative beliefs about the treatment,^{25,28} especially in relation to insulin.²⁶ These findings corroborate previous studies,^{22,28} according to which the success of the treatment is closely related to the patient's perception about their condition and the means to treat it. According to international and national literature,^{22,26} patients who perceive medication as an imposition or a “necessary evil” tend to adopt selective adherence practices, adjusting the use according to their beliefs and not according to clinical prescription.

Conversely, the facilitators observed in this review reinforce the crucial role of social support and structured educational actions. The presence of informal caregivers, encouragement of self-care, and patient-centered approaches emerge as effective strategies for promoting adherence — especially when performed in groups and mediated by health professionals with qualified listening.¹⁸ These findings

are aligned with evidence from the World Health Organization (WHO), according to which social support is highlighted as one of the pillars of adherence to treatment of chronic diseases.²⁹

It is noteworthy that most of the investigations included in this review were conducted in the context of Primary Health Care (PHC) or in outpatient services of chronic follow-up. When analyzing the results, we observed no substantial discrepancies in adherence factors compared to other levels of health care, suggesting that behavioral and logistical barriers for the control of T2DM are transversal. However, the PHC scenario positively stood out in the implementation of facilitators, especially regarding the strategies of longitudinal bond, group education, and the performance of Community Health Agents, which proved essential for the maintenance of long-term adherence.

The inclusion of digital technology for adherence support is still incipient, but promising.³⁰ Tools, such as digital reminders, monitoring applications, and interventions mediated by community agents, were used with positive results in some studies, although in limited number.^{20,27} This aspect is worth of attention in future research, especially in the face of the expansion of the use of mobile devices in PHC.

Adherence assessment, in turn, was not standardized in the analyzed studies. While some used validated instruments, such as MAT,²³ others were based on their own criteria or self-reported perceptions.^{19,24,25} The absence of uniformity for measuring adherence hinders the comparison between studies and the longitudinal monitoring of the effectiveness of interventions.

From the point of view of public policies, the results of this review directly dialogue with the Sustainable Development Goals (SDGs), especially the 3.4 and 3.8 targets, which address the reduction of chronic diseases and universal access to health.³¹ Strategies that combine health education, psychosocial care, community support, and digital technology can significantly contribute to the control of T2DM and to the reduction of health inequalities. The “2021-2030 Strategic Action Plan to Combat NCDs,”³² of the Ministry of Health, reinforces the importance of these integrated actions adapted to the sociocultural profile of SUS users.

This scoping review presents some limitations inherent in the very nature of this type of synthesis, considering that, as recommended by the JBI guidelines, there is no critical evaluation of the methodological quality of the included studies, which may influence the robustness of the findings. In addition, the search strategy was restricted to studies published in English, Portuguese, and Spanish, which may have excluded relevant evidence in other languages.

The time frame may also have limited the identification of foundational studies prior to this period. There was also a concentration of studies in the Brazilian context, which, although it reflects the expressive national production on the subject, may compromise the generalization of the findings to other sociocultural realities and health systems.

Furthermore, it should be noted that the application of specific filters for study designs (clinical trials and reviews) in the search stage, although it has ensured the inclusion of literature with more robust designs, may have limited the numerical recovery of observational or exploratory studies that would be captured in a more sensitive and less specific search.

Regarding the thematic gaps, despite the wide range of factors associated with adherence, we identified few studies addressing the role of digital technologies, such as applications and reminders, in promoting adherence — which suggests an emerging area that requires greater research. Likewise, the use of standardized instruments to assess adherence was heterogeneous, with many studies using self-reported measures or own criteria, making it difficult to compare evidence.

Finally, it is worth highlighting the need for longitudinal studies and integrated interdisciplinary interventions that consider the psychosocial context, community support, and the use of technologies, contributing to strengthening sustainable strategies in addressing barriers to adherence to treatment of T2DM.

CONCLUSION

Considering our results, we highlight that, despite several therapeutic options, adherence is still challenging, being influenced by personal beliefs, social support, and logistical barriers. Digital technologies, such as monitoring applications, were promising in simplifying self-care, aligned with the targets of the SDGs. All in all, in this study, we contribute to the understanding of factors that influence adherence to treatment and reinforce the need for interdisciplinary strategies that consider socioeconomic aspects and technological advances.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

LFJ: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft. EFA: Visualization, Writing – review & editing. ACP: Visualization, Writing – review & editing. AMLBS: Formal analysis, Supervision, Validation, Visualization, Writing – review & editing, Project administration.

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