

Impact of the Mediterranean diet on glycemic control and cardiovascular factors in people with type 2 diabetes

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SUMMARY

Introduction: Type 2 diabetes mellitus is characterized as one of the most prevalent NCDs and has the greatest impact on public health. One of the main modifiable risk factors for the development and worsening of DM2 is inadequate nutrition.

In this context, the Mediterranean diet has stood out for its potential benefits in glycemic control, lipid profile, and reduction of cardiovascular events. **Objective:** This study aims to evaluate the effects of the Mediterranean diet on glycemic control and cardiovascular risk factors in adults with type 2 diabetes, as well as the development of more effective strategies regarding dietary interventions. **Methodology:** This is an integrative literature review with descriptive and exploratory aspects, selecting a total of seven articles from 2020 to 2025. **Results:** The effects of the Mediterranean diet in adults with type 2 diabetes showed significant results. The studies analyzed demonstrated improvements in fasting blood glucose reduction, with positive results regarding glycated hemoglobin (HbA1c), body weight control, and consequently a reduction in cardiovascular risk factors. **Conclusion:** After analyzing the studies in this review, it is concluded that the Mediterranean diet has visible effects on both glycemic control and cardiovascular health. It also shows improvements in lipid profiles, blood pressure, and even the gut microbiota, contributing to a reduction in chronic inflammation. Furthermore, the Mediterranean eating pattern has been shown to be easy to adhere to.

especially due to its composition rich in natural, fresh, minimally processed foods, in addition to being a balanced and sustainable strategy.

Keywords: Mediterranean diet; type 2 diabetes; cardiovascular risk factors; glycemic control.

ABSTRACT

Introduction: Type 2 diabetes mellitus is characterized as one of the most prevalent NCDs and has the greatest impact on public health. One of the main modifiable risk factors for the development and worsening of DM2 is inadequate nutrition. In this context, the Mediterranean diet has stood out for its potential benefits in glycemic control, lipid profile and reduction of cardiovascular events.

Objective: The present study aims to evaluate the effects of the Mediterranean diet on glycemic control and cardiovascular risk factors in adults with type 2 diabetes, as well as the development of more effective strategies regarding dietary interventions. **Methodology:** The study is an integrative bibliographic review with descriptive and exploratory aspects, with a total of 7 articles selected between the years 2020 to 2025.

Results: The effects of the Mediterranean diet in adults with type 2 diabetes have shown significant results. In the studies analyzed, improvements in the reduction of fasting blood glucose levels became evident, with positive results in relation to glycated hemoglobin (HbA1c), body weight control, and consequently a reduction in cardiovascular risk factors.

Conclusion: After analyzing the studies in this review, it is concluded that the Mediterranean diet has visible effects on both glycemic control and cardiovascular health, and also shows improvements in the lipid profile, blood pressure and even the intestinal microbiota, contributing to a reduction in chronic inflammation. Furthermore, the Mediterranean dietary

pattern has proven to be easy to adhere to, especially due to its composition rich in natural, fresh, minimally processed foods, in addition to being a balanced and sustainable strategy.

Keywords: Mediterranean diet; Type 2 diabetes; Cardiovascular risk factors; Glycemic control.

1 Introduction

Type 2 diabetes mellitus is a chronic metabolic disease characterized by insulin resistance and/or decreased insulin production by the pancreas (DIMBA *et al.*, 2024). It is considered one of the most common Chronic Non-Communicable Diseases (NCDs) prevalent and with the greatest impact on public health, data from 2024 indicate that 3.4 million people died from diabetes, 1 every 9 seconds. It is estimated that 1 in every 9 people have been diagnosed with diabetes, approximately 589 million people, and could reach 853 million by 2050 (INTERNATIONAL DIABETES FEDERATION, 2024). In Brazil, the prevalence of diabetes among adults is around 10.2% (BRASIL, 2023).

(NCDs) are responsible for around 43 million deaths worldwide, corresponding to approximately 75%, with more than 2 million deaths attributed to diabetes mellitus (WORLD HEALTH ORGANIZATION, 2023).

One of the main modifiable risk factors for the development and worsening of DM2 is inadequate nutrition. In this context, the Mediterranean diet has stood out for its potential benefits in glycemic control, lipid profile and reduction of events cardiovascular (BONEKAMP *et al.*, 2023). The Mediterranean diet is characterized by a plant-based dietary pattern, rich in fruits, vegetables, whole grains, olive oil, oilseeds and moderate consumption of fish and red wine, this diet is considered palatable and easily accepted (GODOS *et al.*, 2024).

The relationship between the Mediterranean diet, glycemic control and risk factors cardiovascular are of great importance for public health and clinical practice, mainly due to the increasing number of diagnoses of type 2 diabetes and diseases cardiovascular diseases in the world. Therefore, the present study aims to evaluate the effects of the Mediterranean diet on glycemic control and cardiovascular risk factors in adults with type 2 diabetes, contributing to the development of more effective strategies in relation to dietary interventions.

2

2 Methodology

In this work, an integrative bibliographic review study was carried out, descriptive and exploratory characteristics. The study followed the following problem question:

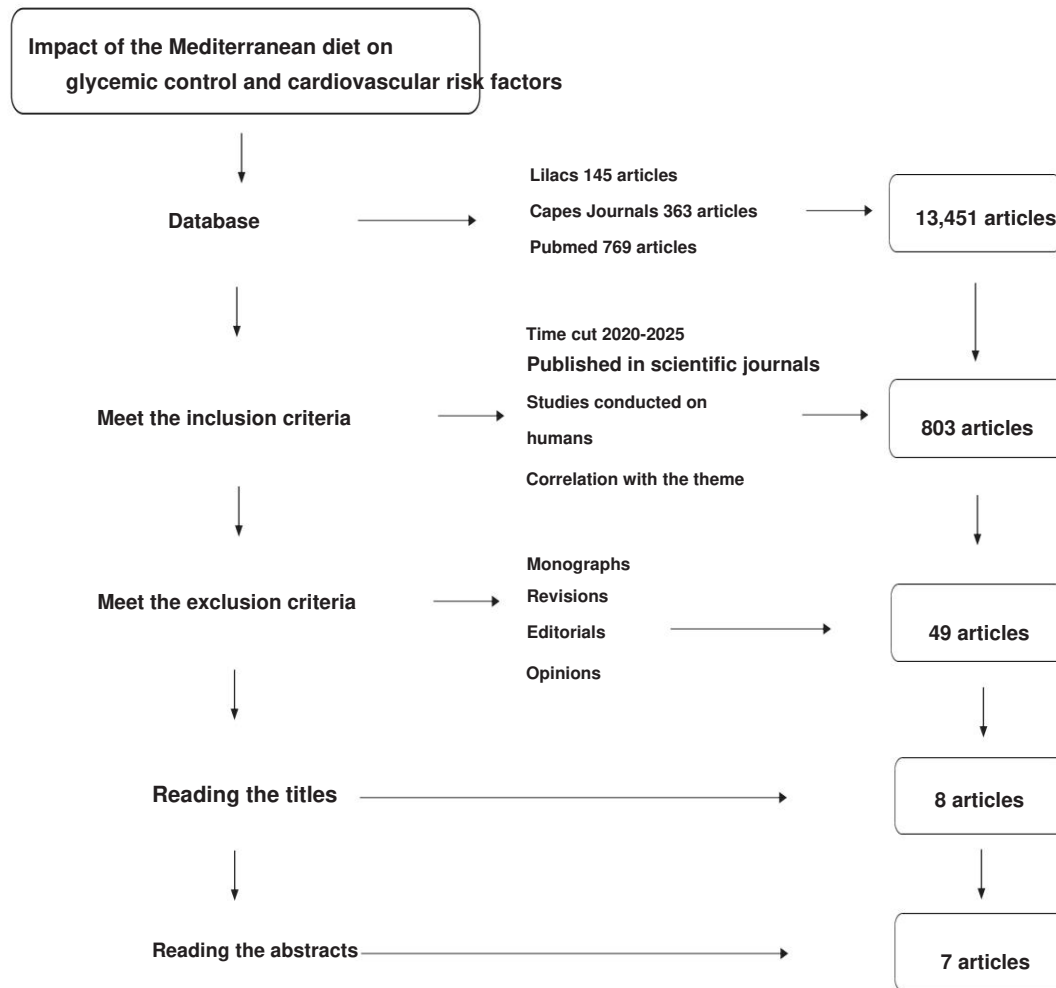
"What is the impact of the Mediterranean diet on glycemic control and risk factors? cardiovascular risk in adults with type 2 diabetes?" The investigation took place on the following databases data: National Library of Medicine (PubMed); Journal Portal of the Coordination of Improvement of Higher Education Personnel (CAPES) and Latin American Literature and Caribbean Health Sciences (LILACS). With the following descriptors: Mediterranean Diet, Mediterranean Diet, Diabetes Mellitus Type 2, Diabetes Mellitus, Type 2; Glycemic Control; glycemic control; Cardiovascular Diseases; Cardiovascular Diseases.

The current research used primary scientific articles as inclusion criteria, published in the scientific databases described above, in the 5-year time frame, between 2020 and 2025, selecting works written in Portuguese and English addressing the central theme: Effects of the Mediterranean diet on glycemic control and cardiovascular risk factors in patients with type 2 diabetes. The exclusion criteria were monographs, editorials, reviews and opinions.

Keywords in English were used with the Boolean operator "AND", and were only primary source articles in English included in this study, Spanish and Portuguese. The following were excluded: monographs, reviews, editorials, opinions and duplications. Studies covering other conditions resulting from DM2 were considered, as long as they mentioned the Mediterranean diet. Data collection followed these steps: initially, the central theme of the study was defined, followed by the delimitation of the criteria of inclusion and exclusion. Subsequently, the titles were read sequentially, followed by analysis of the abstracts, and, finally, the selected articles were read in full.

Searching for the descriptor Mediterranean Diet in the databases resulted in a total of 13,451 articles. Of these, 803 met the inclusion criteria previously established. After applying the exclusion criteria mentioned previously, 49 articles remained. The titles were then read sequentially, those that were not related to the study theme were excluded, totaling 8 articles. Of these, 1 article did not have relevant information for inclusion in the abstracts, resulting in 7 articles. The selection process was structured in an organizational chart (Figure 1), which highlights the main steps involved.

Figure 1. Descriptive organizational chart of the research process of the literature review of this article.



Source: Developed by the authors, 2025.

3 Results and Discussion

In table 1, described below, the most significant results were compiled from each scientific article selected in the research, as well as authors, type of study, year of publication, study location, sample, objectives, methodology, and results. The seven articles are studies published in international journals, carried out in Spain, China, Israel, Portugal and the United States.

Table 1 – Summary of articles analyzed for review.

Article	Author, Year of Design and Publication, Type of Study local of the study	and N	Objectives of Study	Methodology Main	findings
1	Gardner et al; 2022; USA.	Randomized crossover clinical trial. 33 adults with prediabetes or DM2.	Combining the effects of the Mediterranean and ketogenic diets in glycemic and cardiometabolic outcomes.	Participants followed the diets for 12 weeks. Randomized. HbA1c, blood glucose, lipids, weight and adherence were assessed.	Both diets reduced HbA1c, but with no significant difference between them. The ketogenic diet reduced triglyceride levels, but raised LDL. The Mediterranean diet was evaluated more sustainable and with the better supply of fiber and micronutrients.
2	Chavez Alfaro et al; 2025. Spain.	Parallel randomized clinical trial (CADIMED), 156 adults with dyslipidemia.	Analyze the effects on blood lipids and acids fatty, during an intervention with a Mediterranean diet in individuals with restricted processed meat and meat red.	Participants were evaluated during 8 weeks of intervention, all with cholesterol LDL-C between 116-190, with 3 distinct eating patterns. In order to evaluate lipids, intestinal microbiota, cardiovascular biomarkers and adherence to the type of diet.	This study is ongoing, but preliminary results show significant results in reducing the risk of cardiovascular diseases.
3	Martinez González et al; 2023; Spain.	Randomized clinical trial (PREDIMED) with analysis by dietary adherence. 3,541 adults.	To examine the influence of annual adherence to the Mediterranean diet and the incidence of type 2 diabetes.	Participants were divided into 3 groups (Mediterranean diet with olive oil, Mediterranean diet	Every 2 point increase in the MEDAS score was related to a 20% reduction in the risk of type 2 Diabetes Mellitus. Adherence \bar{y} 12 points, reduced by 54% the

				with nuts, and control diet). Adherence assessed annually for 7 years with the score MEASURES.	risk of T2DM compared to <8 points. Regardless of the randomized group, the relationship was linear, reinforcing the impact of continued adherence to the Mediterranean diet.
4	Ben Yacov et al ; 2021 ; Israel .	Randomized, controlled clinical trial blind . 225 adults with pre-diabetes.	Analyze the clinical effects of a Mediterranean diet and a diet postprandial personalized in glycemic control and metabolic health.	Participants followed a Mediterranean diet or postprandial diet personalized the with a 6-month intervention and monitoring continuous glucose level, and plus 6 additional months with accompany then nutritional.	Both diets improved HbA1c with blood glucose >140 mg/dL, but the personalized postprandial diet resulted in a greater reduction. The Mediterranean diet improved glycemic control, but was less effective than the personalized diet.
5	Ismael et al ; 2021 ; Portugal .	Pilot intervention study, clinical trial. 9 adults with DM2	To analyze the effectiveness of the Mediterranean diet intervention on glycemic control and intestinal microbiota composition in adults with type 2 Diabetes Mellitus.	Advise me into nutritional individualizes of promoting adherence to the Mediterranean diet , with Intervention of 12 weeks.	There was a significant reduction in HbA1c after 12 weeks. Changes in the intestinal microbiota appear to precede changes in HbA1c, suggesting that the impact of the Mediterranean diet on type 2 diabetes mellitus is conditioned by the intestinal microbiota.
6	Luo et al ; 2023 ; China .	Randomized clinical trial. 231 adults with pre-diabetes and overweight.	Investigate the lipid signatures linked to different diets food and its effects	Participants were randomized s for Mediterranean diet , diet traditional	were associated with improved insulin sensitivity and beta cell function, fish-related lipids (12 fractions

			in the risk factors for type 2 diabetes.	Chinese or transitional (control) diet, with controlled feeding for 6 months, and to the over time, were lipidomic and metabolic analyses were performed.	TAG and PC 16:0/22:6). The increase in fasting blood glucose and worsening of glucose metabolism were related to red meat consumption were associated with increased.
7	Turner McGrievy et al; 2023, USA	Randomized clinical trial, with 12 weeks of intervention. 63 African adults Americans with risk factors for type 2 diabetes and overweight.	To evaluate the effects of 3 different diets on diet quality, weight reduction, HbA1c and blood pressure.	Participants were randomly assigned and were assigned to 3 different dietary groups, participating in online classes based on the US dietary guidelines.	The Mediterranean diet was considered the best in terms of diet quality, promoted weight reduction and there was no significant reduction in HbA1c and BP.

Source: Table developed by the authors, 2025.

The results include studies regarding the effectiveness of the Mediterranean diet in controlling glycemic status and cardiovascular risk factors in adults with type 2 diabetes. During the analysis from the literature, it was observed that the Mediterranean diet has been increasingly valued as dietary pattern, especially due to its composition rich in natural and fresh foods and low in processed foods, low consumption of red meat and alcohol (DIMBA *et al.*, 2024).

The Mediterranean diet is primarily characterized by a high-calorie eating pattern. consumption of vegetables, greens, fruits, olive oil, whole grains, nuts and fish. Also, includes moderate amounts of red wine and dairy and is low in fat saturated, and is often associated with numerous health benefits (LAFFOND *et al.*, 2023).

Several studies have shown significant results on the effects of diet Mediterranean diet in patients with type 2 diabetes, with positive results in terms of improvement of glycated hemoglobin (HbA1c), reduction of fasting blood glucose, control of body weight, and consequently a reduction in cardiovascular risk factors (JING *et al.*, 2023).

The Mediterranean diet helps control fasting blood glucose levels and also reduces concentration of glycated hemoglobin (HbA1c), due to the low glycemic index of foods allowed in this diet, fiber intake, high intake of soluble fiber, bioactive compounds with anti-inflammatory and antioxidant properties, in addition to the presence of unsaturated fats, contribute to the modulation of the postprandial glycemic response and to improve insulin sensitivity (ZHENG *et al.*, 2024).

Furthermore, adherence to the Mediterranean diet presents effective results in reducing body weight and waist circumference, highlighting the potential of this dietary strategy in control of excess weight and abdominal obesity, which are often associated with development of cardiovascular diseases and type 2 diabetes (PAPADAKI, NOLEN-DOERR, MANTZOROS; 2020).

The studies found generally showed that the Mediterranean dietary pattern, is associated with reductions in LDL cholesterol and triglyceride levels and favors an increase of HDL, contributing to a more balanced lipid profile (GARZA *et al.*, 2024). The results are mainly due to the nutritional composition of the diet, as it is rich in acids monounsaturated fatty acids, derived mainly from olive oil, and polyunsaturated fatty acids unsaturated fats, such as omega-3 from nuts and fish. In addition to low consumption of saturated fats, red meats, and ultra-processed foods. These findings are also more considerable in people with type 2 diabetes, who generally have dyslipidemia atherogenic as part of the metabolic syndrome (SCAGLIONE *et al.*, 2025).

There is also evidence of a reduction in Systemic Blood Pressure (SBP), a reduction in cardiovascular risk factors and inflammatory markers, such as C-reactive protein (SÁNCHEZ-ROSALES *et al.*, 2022).

Results of the randomized study by Martínez-González *et al.* (2023) indicate that the risk of developing Type 2 Diabetes is lower in people who adhere to the standard Mediterranean, the study indicates that adherence to the so-called Mediterranean diet provides weight reduction greater in relation to other diets considered healthy, in addition to improving sensitivity to insulin due to the consumption and variety of fruits, legumes, vegetables and whole grains, which includes a higher fiber intake and as a consequence slows down the absorption of carbohydrates, reducing the risk of developing DM2 according to annual adherence to the diet.

According to the study conducted by Ben-Yacov *et al.* (2021), participants with pre-diabetes who adhered to the Mediterranean diet, presented a reduction in glycated hemoglobin, shorter time with postprandial glycemia, improvement in fasting glycemia and variability

glycemic. In this study, the Mediterranean diet demonstrated good adherence by participants due to its simplicity and practicality.

Turner McGrievy et al. (2023), given the interventions carried out, the Mediterranean diet was related to better diet quality, participants experienced weight loss significant and better adherence. Regarding HbA1c, there was no significant reduction, which can be explained by the short duration of the intervention (12 weeks).

Ismael et al. (2021), HbA1c decreased by 0.67% in two weeks of intervention and showed a drop of almost 0.7% in 12 weeks with the Mediterranean diet. In addition, studies indicate that bacterial diversity in people with DM2 tends to be lower, however, Mediterranean diet has shown significant results in increasing the diversity of microbiota, providing intestinal homeostasis.

In the study by Gardner et al. (2022), participants with prediabetes or T2DM who followed the Mediterranean diet, a significant improvement in cholesterol levels was observed LDL and HbA1c, in addition to covering the best intake of dietary fiber compared to the ketogenic diet, better micronutrient intake profile and consequently showed smaller reductions in essential nutrients, such as folate, vitamin C and magnesium, resulting in a lower risk of nutritional deficiencies.

Preliminary results of a randomized clinical trial, Chávez-Alfaro et al. (2025), indicate that adults who adhered to the Mediterranean pattern with the inclusion of red meat and processed meat, showed negative results in relation to the risk of development of cardiovascular diseases, due to changes in lipid profiles, inflammation and resistance to insulin.

In the study by Luo et al. (2023), carried out in China, three patterns were compared dietary, in the Mediterranean diet, changes in the blood lipid profile were observed and associated with fish intake, these are correlated with better insulin sensitivity and beta cell function, while those associated with red meat showed worsening of blood glucose and presents a greater metabolic risk.

Final Considerations

From the aspects presented and discussed in this study, it becomes evident that existing benefits of adhering to the Mediterranean diet in both glycemic control and in cardiovascular risk factors in adults with DM2, especially when followed with accuracy. However, some studies have shown modest results similar to other

dietary interventions, however, the Mediterranean diet stands out for its nutritional quality, good adherence of participants and for being a balanced and sustainable strategy.

In addition, other data presented show improvement in the lipid profile, blood pressure arterial and even in the intestinal microbiota, which can interfere in the reduction of chronic inflammation. Demonstrating that the Mediterranean pattern acts in different areas simultaneously, highlighting its importance in dietary treatment in people with type 2 diabetes mellitus and who have various metabolic changes.

In another analysis, despite the positive effects on glycemic control and health cardiovascular in people with type 2 diabetes mellitus, the Mediterranean diet has shown negative results in the face of the risk of developing cardiovascular diseases, in individuals who consumed red meat and processed meat.

In this sense, more long-term research is needed, given the need for different samples, but the Mediterranean diet proves to be a valuable tool in clinical practice.

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