Jejum intermitente e seus efeitos metabólicos: benefícios, riscos e evidências científicas atuais

Intermittent fasting and its metabolic effects: benefits, risks, and current scientific evidence

Ayuno intermitente y sus efectos metabólicos: beneficios, riesgos y evidencia científica actual

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REVISA

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RESUMO

Introdução: O jejum intermitente tem sido estudado como estratégia nutricional para redução de peso e melhora metabólica. Entretanto, seus efeitos e superioridade em relação às dietas convencionais ainda permanecem controversos. **Objetivo:** Analisar as evidências científicas atuais sobre os efeitos metabólicos do jejum intermitente. **Métodos:** Revisão integrativa da literatura realizada nas bases PubMed, SciELO e LILACS, incluindo estudos publicados nos últimos cinco anos sobre jejum intermitente em humanos. Após critérios de elegibilidade, 10 estudos compuseram a revisão. **Resultados:** Protocolos como time-restricted eating (TRE) e alternate day fasting (ADF) promoveram redução do peso corporal, circunferência abdominal e melhora da sensibilidade à insulina, principalmente em indivíduos com obesidade. Contudo, os benefícios metabólicos mostraram-se heterogêneos e frequentemente semelhantes aos observados com restrição calórica contínua. **Conclusão:** O jejum intermitente apresenta potencial benefício metabólico, porém sem superioridade consistente sobre dietas hipocalóricas tradicionais.

Descritores: Jejum intermitente; metabolismo; obesidade; resistência à insulina.

ABSTRACT

Introduction: Intermittent fasting has been studied as a nutritional strategy for weight reduction and metabolic improvement. However, its effects and superiority compared to conventional diets remain controversial. **Objective**: To analyze the current scientific evidence on the metabolic effects of intermittent fasting. **Methods**: An integrative literature review was conducted in the PubMed, SciELO, and LILACS databases, including studies published in the last five years on intermittent fasting in humans. After eligibility criteria, 10 studies comprised the review. **Results**: Protocols such as time-restricted eating (TRE) and alternate day fasting (ADF) promoted reduction in body weight, abdominal circumference, and improved insulin sensitivity, mainly in individuals with obesity. However, the metabolic benefits proved to be heterogeneous and frequently similar to those observed with continuous caloric restriction. **Conclusion**: Intermittent fasting presents potential metabolic benefits, but without consistent superiority over traditional hypocaloric diets.

Descriptors: Intermittent fasting; metabolism; obesity; insulin resistance.

RESUMEN

Introducción: El ayuno intermitente se ha estudiado como estrategia nutricional para la reducción de peso y la mejora metabólica. Sin embargo, sus efectos y su superioridad frente a las dietas convencionales siguen siendo controvertidos. Objetivo: Analizar la evidencia científica actual sobre los efectos metabólicos del ayuno intermitente. **Métodos:** Se realizó una revisión bibliográfica integradora en las bases de datos PubMed, SciELO y LILACS, incluyendo estudios publicados en los últimos cinco años sobre ayuno intermitente en humanos. Tras aplicar los criterios de elegibilidad, se incluyeron 10 estudios en la revisión. **Resultados:** Protocolos como la alimentación con restricción de tiempo (ART) y el ayuno en días alternos (ADA) promovieron la reducción del peso corporal, la circunferencia abdominal y la mejora de la sensibilidad a la insulina, principalmente en personas con obesidad. Sin embargo, los beneficios metabólicos resultaron ser heterogéneos y, con frecuencia, similares a los observados con la restricción calórica continua. **Conclusión:** El ayuno intermitente presenta potenciales beneficios metabólicos, pero sin una superioridad consistente sobre las dietas hipocalóricas tradicionales.

Descriptores: Ayuno intermitente; metabolismo; obesidad; resistencia a la insulina

Introduction

Obesity and its associated metabolic diseases currently represent one of the major global public health challenges due to their high prevalence, complexity, and significant impact on population morbidity and mortality. Recent data from the World Health Organization (WHO) estimate that more than 1 billion individuals worldwide are living with obesity, accompanied by a substantial increase in the prevalence of metabolic syndrome, type 2 diabetes mellitus (T2DM), and atherosclerotic cardiovascular diseases [1].

In Brazil, epidemiological data demonstrate a continuous increase in overweight and obesity rates over recent decades across different age groups and socioeconomic conditions. Furthermore, there has been a rising incidence of systemic arterial hypertension (SAH), insulin resistance, dyslipidemia, and chronic inflammation, all of which are associated with metabolic disturbances and the development of cardiovascular and renal complications [2,3].

In addition to their high prevalence, metabolic diseases are also associated with functional disability, reduced life expectancy, and impaired quality of life. Furthermore, they impose a substantial economic burden due to costs related to hospitalizations, medications, and loss of productivity [4,5].

Among current dietary approaches, intermittent fasting has emerged as one of the most widely studied and practiced strategies in recent years. Its growing popularity has been driven by extensive media coverage and an increasing number of clinical studies suggesting favorable effects on metabolic parameters and cardiometabolic markers. Unlike traditional dietary interventions, intermittent fasting is characterized by the alternation between periods of food consumption and voluntary energy restriction [6].

Among its main modalities are time-restricted eating (TRE), in which food intake is limited to specific hours of the day, and alternate-day fasting (ADF), which alternates between days of habitual eating and days of caloric restriction. Although these approaches share similar physiological mechanisms, methodological differences between the protocols make direct comparisons of clinical outcomes challenging [7,8].

The metabolic effects of intermittent fasting have been attributed to multiple physiological mechanisms. During prolonged periods of food restriction, hepatic glycogen stores are depleted, promoting a metabolic shift toward increased utilization of fatty acids and ketone bodies as energy substrates. This process appears to be associated with improved insulin sensitivity. In parallel, experimental and clinical studies have described the activation of pathways related to cellular autophagy, enhanced mitochondrial biogenesis, modulation of oxidative stress, and reductions in systemic inflammatory mediators, including C-reactive protein and pro-inflammatory cytokines [9].

Neuroendocrine mechanisms involving leptin, ghrelin, and cortisol also appear to play a role in the regulation of appetite, energy balance, and metabolic homeostasis during fasting, suggesting that this strategy may have therapeutic potential in conditions associated with insulin resistance and chronic metabolic inflammation [9,10].

Furthermore, evidence indicates that intermittent fasting may promote reductions in body weight, waist circumference, fasting blood glucose (FBG), glycated hemoglobin (HbA1c), and inflammatory markers in individuals with obesity and T2DM. Some studies have also reported improvements in lipid profile and blood pressure. However,

the findings remain heterogeneous and may vary according to individual factors and the specific characteristics of the fasting protocols employed [11,12].

Although intermittent fasting is often described as a safe and beneficial strategy, it also presents limitations and potential clinical risks. Episodes of hypoglycemia, headache, fatigue, irritability, sleep disturbances, and loss of lean body mass have been reported, particularly in prolonged fasting protocols or when conducted without appropriate supervision [4,13].

Despite the growing number of publications on the subject, considerable disagreement remains regarding the effectiveness, safety, and clinical applicability of intermittent fasting. Methodological limitations, including small sample sizes, short follow-up periods, and heterogeneity among fasting protocols, hinder more robust conclusions and contribute to conflicting findings, particularly concerning long-term outcomes and the superiority of this approach compared with other nutritional interventions [7,14].

Given this scenario, a comprehensive analysis of the available evidence on the metabolic effects of intermittent fasting is warranted, taking into account its benefits, risks, methodological limitations, and clinical applicability. In this context, the present study aims to critically analyze the current evidence regarding the metabolic effects of intermittent fasting, including its potential benefits, risks, physiological mechanisms, and limitations reported in the literature.

Methodology

This study consists of an integrative literature review with a qualitative approach and a descriptive-analytical design, conducted with the objective of gathering, critically analyzing, and synthesizing current scientific evidence regarding the metabolic effects of intermittent fasting, including its potential benefits, risks, and clinical implications.

The review was developed in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The literature search strategy was conducted using the PubMed/MEDLINE, SciELO, and Latin American and Caribbean Health Sciences Literature (LILACS) databases.

To develop the search strategy, controlled descriptors were selected from the Health Sciences Descriptors (DeCS) and the Medical Subject Headings (MeSH) databases. The Portuguese descriptors used were: “jejum intermitente” (intermittent fasting), “metabolismo” (metabolism), “perda de peso” (weight loss), “resistência à insulina” (insulin resistance), “obesidade” (obesity), and “saúde metabólica” (metabolic health). The English descriptors employed were: “intermittent fasting,” “metabolism,” “weight loss,” “insulin resistance,” “obesity,” and “metabolic health.” These descriptors were combined using the Boolean operators AND and OR, resulting in search strategies such as: (“intermittent fasting” AND “metabolism”) OR (“intermittent fasting” AND “metabolic health”) OR (“intermittent fasting” AND “insulin resistance”), adapted according to the requirements of each database.

The search strategies applied were: (("intermittent fasting"[Title]) AND ("insulin resistance"[Title] OR "metabolic health"[Title] OR obesity[Title])) in PubMed; ("jejum intermitente" OR "intermittent fasting") AND (metabolismo OR metabolism OR "saúde metabólica" OR "metabolic health" OR "resistência à insulina" OR "insulin resistance" OR

obesidade OR obesity OR "perda de peso" OR "weight loss") in SciELO; and (tw:("jejum intermitente" OR "intermittent fasting")) AND (tw:("resistência à insulina" OR "insulin resistance" OR "saúde metabólica" OR "metabolic health" OR obesidade OR obesity)) in LILACS. The studies retrieved through these search strategies are presented in Table 1.

The study selection process was conducted between March and April 2026, considering articles published within the previous five years. Original studies, systematic reviews, meta-analyses, and clinical trials published in Portuguese and English were included, provided that they were available in full text and directly addressed the metabolic effects associated with intermittent fasting in humans. Duplicate studies, conference abstracts, letters to the editor, dissertations, theses, book chapters, experimental studies conducted exclusively in animal models, and publications not directly related to the study objective were excluded.

The study selection process was carried out in several stages. Initially, publications were identified through searches in the selected databases, followed by the removal of duplicate records. Subsequently, titles and abstracts were screened to assess their compliance with the eligibility criteria. Relevant articles were then subjected to full-text review to confirm their inclusion in the final sample of the integrative review.

Data extraction was performed using a standardized approach and included information regarding the authors, year of publication, study design, study population, intermittent fasting protocols employed, primary metabolic outcomes assessed, and the main findings reported. Following extraction, the data were organized, compared, and analyzed descriptively, with particular emphasis on the effects of intermittent fasting on metabolic parameters. The study selection process was presented through a flowchart and is detailed in Figure 1.

Figure 1. Flow diagram of the study selection process for the review.

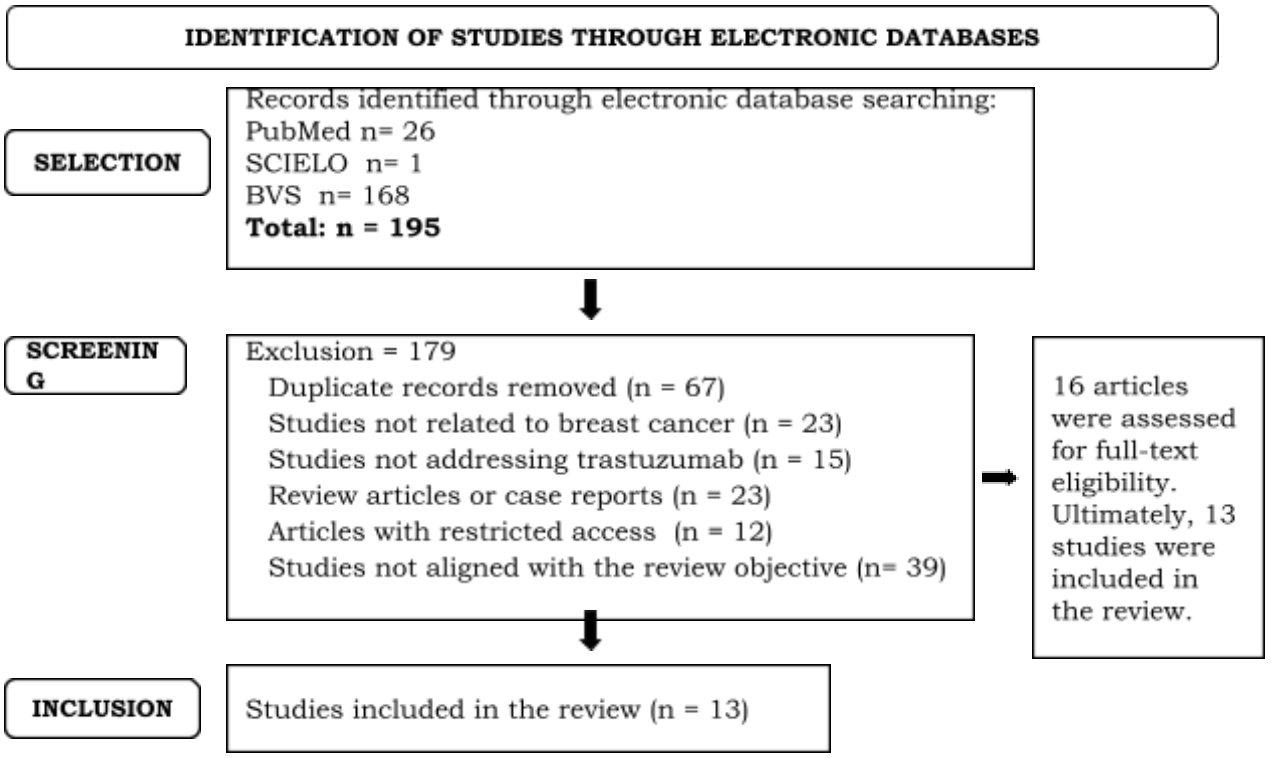

Table 1. Results of the literature search across the selected databases.

Database	Search Strategy	Articles
PUBMED	((("intermittent fasting"[Title]) AND ("insulin resistance"[Title] OR "metabolic health"[Title] OR obesity[Title]))	125
SCIELO	("jejum intermitente" OR "intermittent fasting") AND (metabolismo OR metabolism OR "saúde metabólica" OR "metabolic health" OR "resistência à insulina" OR "insulin resistance" OR obesidade OR obesity OR "perda de peso" OR "weight loss")	14
LILACS	(tw:("resistência à insulina" OR "insulin resistance" OR "saúde metabólica" OR "metabolic health" OR obesidade OR obesity))	80
TOTAL		219

Results and discussion

Initially, the database search retrieved a total of 219 studies, including 125 from PubMed, 14 from SciELO, and 80 from LILACS. After applying the time filter, 182 studies remained. Subsequently, 46 studies were excluded because their full texts were not available. A screening process was then conducted to identify duplicate records across the databases, resulting in the exclusion of 72 articles. The remaining studies underwent title screening, during which 35 articles were excluded for not adequately addressing the proposed topic. The 29 remaining studies were subjected to abstract review, and, following a thorough evaluation by the authors, 10 articles were selected for inclusion in the review.

Table 1. Data extracted from the articles selected for inclusion in the review.

Authors	Methodology	Sample	Fasting Protocols	Results
Silverii GA, Cresci B, Benvenuti F, Santagiuliana F, Rotella F, Mannucci E; 2023	Meta-analysis of randomized controlled trials	9 randomized controlled trials, comprising a total of 540 participants with obesity	Alternate-Day Fasting (ADF) and Time-Restricted Eating (TRE) versus calorie-restricted diets.	Intermittent fasting did not result in greater weight loss compared with control diets or continuous calorie restriction in individuals with obesity. Regarding metabolic parameters, intermittent fasting did not demonstrate significant benefits; however, it was associated with a reduction in LDL cholesterol levels in the short term
Huang L, Chen Y, Wen S, Lu D, Shen X, Deng H, et al., 2022	Systematic review and meta-analysis of randomized controlled trials	8 randomized controlled trials, totaling 464 participants	Time-restricted eating (TRE) no modelo 8/16	The 16:8 TRE protocol resulted in a significant reduction in body weight compared with control groups, with an average weight loss of approximately 1.48 kg. A beneficial effect on insulin resistance was also observed.
Gu L, Fu R, Hong J, Ni H, Yu K, Lou H; 2022	Meta-analysis of randomized	24 randomized controlled	Alternate day fasting (ADF); Modified	Intermittent fasting resulted in significant reductions in body weight, body mass index (BMI),

	controlled trials	trials, totaling 1,768 participants	alternate day fasting; Time-restricted eating (TRE);	and waist circumference compared with no-intervention control groups. Improvements in several metabolic parameters were also observed.
Xu R, Cao YX, Chen YT, Jia YQ; 2022	Randomized controlled trial (RCT)	48 adults with obesity	TRE (Time-Restricted Eating) versus Grupo ERD (Energy-Restricted Diet)	Both intermittent and continuous energy restriction resulted in reductions in body weight, body mass index (BMI), body fat percentage, waist circumference, and hip circumference. The intermittent energy restriction (iER) group demonstrated superior metabolic outcomes.
Çelik OM, Köksal E, Aktürk M; 2023	Pilot interventional study	23 healthy overweight women	TRE (Time-Restricted Eating) versus Grupo ERD (Energy-Restricted Diet)	Weight loss was greater in the ERD group. However, both groups demonstrated significant improvements in metabolic parameters.
Suthutvoravut U, Anothaisintawee T, Boonmanunt S, Pramyothin S, Siriyothin S, Attia J, et al., 2023	Randomized controlled trial	72 participants with impaired fasting glucose	TRE (Time-Restricted Eating) e controle	No significant differences were observed between the groups regarding body weight, fasting plasma glucose, glycated hemoglobin (HbA1c), fasting insulin levels, or lipid profile.
Fagundes GBP, Tibães JRB, Silva ML, Braga MM, Silveira ALM, Teixeira AL, et al., 2022	Randomized controlled trial (RCT)	36 women aged 18 to 59 years with overweight or obesity	TRE (Time-Restricted Eating) e controle	The TRE group experienced greater weight loss compared with the control group. A larger reduction in fat mass was also observed in the TRE group. No significant changes were found in metabolic parameters.
Thomas EA, Zaman A, Sloggett KJ, Steinke S, Grau L, Catenacci VA, et al., 2022	Randomized controlled trial (RCT)	139 adults with obesity	Time-Restricted Eating (TRE) combined with a calorie-restricted diet versus a calorie-restricted diet alone.	No statistically significant difference in weight loss was observed between the groups. Likewise, no relevant differences were found between the groups regarding cardiometabolic parameters and body composition.
Lin S, Cienfuegos S, Ezpeleta M, Gabel K, Pavlou V, Mulas A, et al., 2023	Randomized controlled trial (RCT)	90 adults with obesity	Time-Restricted Eating (TRE), Continuous Calorie Restriction (CR), and control group.	TRE was effective in reducing body weight without the need for calorie counting, suggesting greater practicality and potential for clinical adherence. However, cardiometabolic markers did not differ significantly between the groups.

Lowe DA, Wu N, Rohdin-Bibby L, Moore AH, Kelly N, Liu YE, et al., 2021	Randomized controlled trial (RCT)	116 adults with overweight or obesity	Time-Restricted Eating (TRE), Continuous Calorie Restriction (CR), and control group.	Both the TRE and continuous calorie restriction groups achieved significant weight reduction. No relevant differences were observed between the groups regarding cardiometabolic outcomes.

Intermittent fasting is a dietary strategy characterized by alternating periods of eating and planned periods of voluntary energy restriction. Unlike conventional diets, which primarily focus on the quality or quantity of food consumed, intermittent fasting is mainly based on the temporal manipulation of food intake [8,15].

Among the protocols most frequently evaluated in the studies included in this review are time-restricted eating (TRE), in which food intake is limited to a specific daily time window, generally ranging from 6 to 10 hours; alternate-day fasting (ADF), characterized by alternating days of habitual eating and days of caloric restriction; and intermittent energy restriction (iER), which combines periods of higher and lower energy intake throughout the week. Although these models share similar physiological mechanisms, their methodological differences make direct comparison of findings across studies challenging [15,16].

Furthermore, considerable heterogeneity was observed among the studies regarding intervention duration, dietary composition, feeding windows, participants' metabolic profiles, and the presence of associated interventions such as physical exercise and caloric restriction. These factors limit the uniform interpretation of the clinical findings [16].

The potential metabolic effects of intermittent fasting have been mainly attributed to the so-called metabolic switch, a phenomenon that occurs after the partial depletion of hepatic glycogen stores. In this context, the body begins to rely predominantly on fatty acids and ketone bodies as energy sources, promoting changes associated with improved insulin sensitivity and lipid metabolism. Furthermore, experimental studies suggest the activation of mechanisms related to cellular autophagy, reduction of oxidative stress, improvement of mitochondrial function, and modulation of systemic inflammatory mediators [16,17].

From a pathophysiological perspective, these effects appear to involve the activation of AMP-activated protein kinase (AMPK) and inhibition of the mammalian target of rapamycin (mTOR) pathway, mechanisms associated with the regulation of energy homeostasis, autophagy, and cellular adaptation to metabolic stress. Additionally, increased ketogenesis and metabolic flexibility may contribute to improved insulin sensitivity and reduced lipotoxicity in individuals with obesity and insulin resistance. However, despite these theoretically favorable physiological mechanisms, the clinical outcomes observed in human studies remain inconsistent, particularly when compared with traditional hypocaloric diets [16,17].

Regarding body weight loss, most of the studies included reported favorable outcomes associated with intermittent fasting. Overall, a trend toward reductions in body weight, body mass index (BMI), and waist circumference was observed among individuals following primarily TRE and ADF protocols, especially those with overweight or obesity. Huang et al. (2022), when evaluating the 16:8 TRE protocol, reported significant reductions in body weight and fat mass among individuals with

overweight and obesity. Similar findings were reported by Gu et al. (2022), whose meta-analysis demonstrated reductions in body weight, body mass index (BMI), and waist circumference across different intermittent fasting modalities [16,17].

Similarly, Xu et al. (2022) observed greater weight loss in the group undergoing intermittent energy restriction combined with high-intensity interval training compared with the group following continuous energy restriction. These findings suggest that intermittent fasting may represent a useful tool for weight reduction, particularly among individuals with overweight and obesity [18].

However, part of these effects may be more closely related to a spontaneous reduction in total caloric intake rather than to the intermittent distribution of meals itself. This hypothesis is supported by the fact that intermittent fasting has not consistently demonstrated superior results compared with conventional hypocaloric diets.

Although weight loss is one of the most consistent findings, it remains controversial whether intermittent fasting is superior to conventional calorie restriction. Silverii et al. (2023), in a meta-analysis involving individuals with obesity, concluded that intermittent fasting did not promote significantly greater weight loss than traditional hypocaloric diets [15].

Similar results were reported by Lowe et al. (2021), Thomas et al. (2022), and Lin et al. (2023), who demonstrated comparable weight reductions between participants undergoing TRE and those following continuous calorie restriction alone. These findings support the hypothesis that total energy deficit may be the primary determinant of weight loss, regardless of meal timing distribution. Therefore, some of the benefits attributed to intermittent fasting may be more closely related to reduced caloric intake than to specific metabolic effects of the dietary protocol.[19,20,21] Furthermore, methodological variability among clinical trials limits definitive conclusions regarding the superiority of any specific protocol, as different studies employed distinct feeding windows, follow-up durations, and dietary control strategies.

In addition to anthropometric effects, the studies also investigated potential metabolic benefits associated with intermittent fasting. Overall, the findings related to glycemic and lipid markers were more heterogeneous than those observed for weight loss. Huang et al. (2022) reported a significant improvement in insulin resistance through a reduction in the Homeostatic Model Assessment for Insulin Resistance (HOMA-IR), a marker used to estimate insulin resistance based on fasting glucose and insulin levels. A decrease in this index suggests improved insulin sensitivity and glucose metabolism.[17] Gu et al. (2022) also identified beneficial effects on fasting glucose levels and certain components of the lipid profile.[16] Silverii et al. (2023) reported reductions in LDL cholesterol levels in the short term, although this benefit was not sustained in longer-term assessments [15].

Furthermore, Xu et al. (2022) demonstrated improvements in lipid profile and cardiorespiratory fitness among individuals undergoing intermittent energy restriction combined with physical exercise. These findings suggest a potential favorable impact of intermittent fasting on factors related to cardiovascular risk and insulin resistance, particularly in metabolically compromised individuals.[18] Such benefits may be associated with improved metabolic flexibility, reduced compensatory hyperinsulinemia, and modulation of inflammatory cytokines linked to visceral adipose tissue.

However, the metabolic effects observed were not consistent across studies. Fagundes et al. (2022), Lin et al. (2023), Lowe et al. (2021), and Suthutvoravut et al. (2023)

found no significant differences between groups regarding glucose levels, glycated hemoglobin (HbA1c), lipid profile, or other cardiometabolic markers. In many cases, anthropometric improvements were observed without substantial metabolic changes, indicating that weight loss does not always translate into clinically relevant metabolic benefits in the short term [20,21,22,23].

Furthermore, Suthutvoravut et al. (2023) demonstrated that glycemic benefits were observed primarily among participants with higher adherence to the protocol, highlighting the important influence of behavioral factors on clinical outcomes. These discrepancies suggest that factors such as adherence level, baseline metabolic profile, intervention duration, and degree of energy restriction may substantially modify the effects of intermittent fasting.[22] Additionally, metabolically healthy individuals appear to respond less favorably to these interventions when compared with those with obesity, insulin resistance, or prediabetes, suggesting that baseline metabolic status may influence the observed outcomes.

Another important aspect concerns body composition and the preservation of lean mass. Although some studies reported a predominant reduction in body fat, Fagundes et al. (2022) also observed a loss of fat-free mass in women following the 16:8 TRE protocol. Gu et al. (2022) reported similar findings in a portion of the clinical trials included in their analysis [16,23].

In contrast, Huang et al. (2022) suggested relatively stable preservation of lean mass during TRE. These discrepancies are clinically relevant, considering that muscle loss may compromise basal metabolic rate, physical functionality, and long-term weight maintenance. The lack of standardization regarding protein intake and physical activity across the analyzed studies may partly explain these diferences [17].

Time-restricted eating protocols also demonstrated important differences regarding clinical applicability and adherence. Lin et al. (2023) highlighted that TRE may represent a simpler and more practical strategy because it does not require rigorous calorie counting, potentially favoring adherence in certain individuals. However, Thomas et al. (2022) reported significant difficulties in maintaining early time-restricted feeding protocols due to social, family, and occupational factors. Silverii et al. (2023) emphasized that treatment adherence likely exerts a greater impact on outcomes than the specific fasting protocol employed [15, 19,20] .

Therefore, although intermittent fasting has potential clinical applications, its long-term sustainability remains a significant challenge, particularly outside controlled research settings.[15,19,20] Recent evidence suggests that feeding protocols aligned with circadian rhythms, especially those concentrating food intake during the earlier hours of the day, may promote more favorable metabolic effects on glycemic control, insulin sensitivity, and energy metabolism. In contrast, late eating windows appear to be associated with poorer metabolic control, possibly due to the misalignment between food intake and endogenous biological rhythms [15,20].

The findings of Çelik et al. (2023) provide an important counterpoint to the evidence supporting intermittent fasting. In their study, overweight women following a 16:8 TRE protocol experienced weight loss and improvements in certain metabolic parameters; however, continuous energy restriction produced superior outcomes regarding body composition and dietary quality. Furthermore, although the TRE group showed a reduction in LDL cholesterol levels, only conventional calorie restriction

resulted in a significant increase in adiponectin levels and an improvement in total antioxidant status, suggesting potentially more consistent metabolic effects [24].

Methodological limitations of the included studies also contribute to the existing uncertainties. A large proportion of the clinical trials were characterized by small sample sizes, short follow-up periods, and substantial heterogeneity in the dietary protocols employed. Additionally, many studies involved specific populations, such as healthy young women, adults with obesity, or individuals with prediabetes, limiting the generalizability of the findings to other clinical conditions [19,20].

Another important limitation concerns the lack of standardization regarding total caloric intake, macronutrient composition, meal timing, and monitoring of adherence to the intervention protocols. In several studies, energy intake was self-reported, increasing the risk of information bias and underreporting of food consumption. Furthermore, many trials had relatively short follow-up periods, limiting the assessment of long-term weight maintenance, metabolic adaptation, and clinical safety.

Another important aspect concerns the scarcity of data regarding metabolic safety and long-term weight maintenance. Even studies with longer follow-up periods, such as those conducted by Thomas et al. (2022) and Lin et al. (2023), did not demonstrate consistent superiority of intermittent fasting over traditional calorie restriction [19,20].

Therefore, the findings of this review indicate that intermittent fasting may represent an effective strategy for weight reduction and potential improvement of certain metabolic parameters, particularly among individuals with overweight, obesity, and insulin resistance. However, the observed benefits remain inconsistent and are often comparable to those achieved through continuous calorie restriction. The discrepancies among studies may be attributed to methodological heterogeneity, differences in dietary protocols, varying levels of participant adherence, and the clinical characteristics of the populations evaluated.

Thus, although intermittent fasting has shown promising results and has attracted increasing scientific interest, important uncertainties remain regarding its metabolic superiority, long-term sustainability, and universal clinical applicability. These findings reinforce the need for more robust, standardized studies with extended follow-up periods.

Conclusion

Intermittent fasting may promote body weight reduction, decreased waist circumference, and improvement in certain metabolic parameters, particularly among individuals with overweight, obesity, and insulin resistance. Protocols such as Time-Restricted Eating (TRE) and Alternate-Day Fasting (ADF) have shown favorable outcomes, especially regarding weight loss and insulin sensitivity.

However, despite the beneficial physiological mechanisms associated with intermittent fasting, current evidence does not demonstrate metabolic superiority compared with continuous calorie restriction. In several studies, the effects observed on glycemic control, lipid profile, and body composition were similar to those achieved with conventional hypocaloric diets, suggesting that total energy deficit and treatment adherence play a significant role in determining clinical outcomes.

Furthermore, the methodological heterogeneity of the included studies, involving differences in dietary protocols, intervention duration, population characteristics, and

methods of metabolic assessment, limits the standardization of findings and hinders definitive conclusions regarding the long-term effectiveness and safety of intermittent fasting.

Therefore, although intermittent fasting represents a promising strategy for the management of metabolic alterations, its clinical application should be individualized according to each patient's characteristics and needs. Moreover, more robust clinical studies with greater methodological standardization and extended follow-up periods are needed to further clarify its metabolic effects and long-term clinical impact.

References

1. OMS- Organização Mundial da Saúde. Obesity and overweight [Internet]. Geneva: WHO; 2024. Acesso em: 13.mar.2026. Disponível em: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight?

2. Brasil. Ministério da Saúde. Vigitel Brasil 2023: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico. Brasília: Ministério da Saúde; 2023.

3. Malta DC, Bernal RTI, Silva AG, Lima MG, Almeida WS, Sá ACMGN, et al. Tendências de indicadores de obesidade nas capitais brasileiras. Rev Bras Epidemiol. 2023;26:e230012.

4. American Diabetes Association. Standards of care in diabetes—2025. Diabetes Care. 2025;48(Suppl 1):S1-S350.

5. Nilson EAF, Andrade RCS, Brito DA, Oliveira ML. Custos atribuíveis à obesidade, hipertensão e diabetes no Sistema Único de Saúde. Rev Panam Salud Publica. 2020;44:e32.

6. de Cabo R, Mattson MP. Effects of intermittent fasting on health, aging, and disease. N Engl J Med. 2019;381(26):2541-51.

7. Varady KA, Cienfuegos S, Ezpeleta M, Gabel K. Clinical application of intermittent fasting for weight loss: progress and future directions. Nat Rev Endocrinol. 2022;18(5):309-21

8. Liu D, Huang Y, Huang C, Yang S, Wei X, Zhang P, et al. Intermittent fasting interventions and metabolic outcomes: umbrella review of meta-analyses. Nutrients. 2024;16(2):311.

9. Wilkinson MJ, Manoogian ENC, Zadourian A, Lo H, Fakhouri S, Shoghi A, et al. Ten-hour time-restricted eating reduces weight, blood pressure, and atherogenic lipids in patients with metabolic syndrome. Cell Metab. 2020;31(1):92-104.

10. Anton SD, Moehl K, Donahoo WT, Marosi K, Lee SA, Mainous AG, et al. Flipping the metabolic switch: understanding and applying the health benefits of fasting. Obesity (Silver Spring). 2021;29(1):18-30.

11. Moon S, Kang J, Kim SH, Chung HS, Kim YJ, Yu JM, et al. Beneficial effects of intermittent fasting: a narrative review. J Yeungnam Med Sci. 2020;37(1):4-11.

12. Coutinho SR, Halset EH, Gåsbakk S, Rehfeld JF, Kulseng B, Truby H, et al. Effects of intermittent fasting on metabolic parameters: systematic review and meta-analysis. Nutrients. 2022;14(14):2956.

13. Allaf M, Elghazaly H, Mohamed OG, Fareen MFN, Zaman S, Salmasi AM, et al. Intermittent fasting for the prevention of cardiovascular disease. Cochrane Database Syst Rev. 2021;1(1):CD013496.

14. Li G, Xie C, Lu S, Nichols RG, Tian Y, Li L, et al. Intermittent fasting and metabolic health: current evidence and future directions. Front Nutr. 2023;10:1187214.

15. Silverii GA, Cresci B, Benvenuti F, Santagiuliana F, Rotella F, Mannucci E. Effectiveness of intermittent fasting for weight loss in individuals with obesity: A meta-analysis of randomized controlled trials. Nutrition, Metabolism and Cardiovascular Diseases [Internet]. 2023 May 10;33(8). Available from: https://www.sciencedirect.com/science/article/pii/S0939475323001862

16. Gu L, Fu R, Hong J, Ni H, Yu K, Lou H. Efeitos do jejum intermitente em humanos comparados a uma dieta sem intervenção e à restrição calórica: uma meta-análise de ensaios clínicos randomizados controlados. Frontiers in Nutrition. 2022 maio 2;9.

17. Huang L, Chen Y, Wen S, Lu D, Shen X, Deng H, et al. A alimentação com restrição de tempo (8/16) é benéfica para o peso corporal e o metabolismo de adultos obesos e com sobrepeso? Uma revisão sistemática e meta-análise de ensaios clínicos randomizados. PubMed Central. 2022 Dec 19;11(3):1187–200.

18. Xu R, Cao YX, Chen YT, Jia YQ. Efeitos diferenciais da restrição energética intermitente versus restrição energética contínua combinada com treinamento intervalado de alta intensidade em adultos com sobrepeso/obesos: um ensaio clínico randomizado controlado. Frontiers in Nutrition. 2022 Nov 8;9.

19. Thomas EA, Zaman A, Sloggett KJ, Steinke S, Grau L, Catenacci VA, et al. Alimentação com restrição de tempo precoce comparada à restrição calórica diária: um ensaio randomizado em adultos com obesidade. Obesity. 2022 Apr 26;30(5):1027–38.

20. Lin S, Cienfuegos S, Ezpeleta M, Gabel K, Pavlou V, Mulas A, et al. Alimentação com restrição de tempo sem contagem de calorias para perda de peso em uma população racialmente diversa: um ensaio clínico randomizado controlado. Annals of Internal Medicine [Internet]. 2023 Jul 1;176(7):885–95. Disponível em: https://pubmed.ncbi.nlm.nih.gov/37364268/

21. Lowe DA, Wu N, Rohdin-Bibby L, Moore AH, Kelly N, Liu YE, et al. Efeitos da alimentação com restrição de tempo na perda de peso e outros parâmetros metabólicos

em mulheres e homens com sobrepeso e obesidade: o ensaio clínico randomizado TREAT. JAMA Internal Medicine [Internet]. 28 de setembro de 2020;180(11). Disponível em: https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2771095

22. Suthutvoravut U, Anothaisintawee T, Boonmanunt S, Pramyothin S, Siriyothin S, Attia J, et al. Efficacy of time-restricted eating and behavioral economic intervention in reducing fasting plasma glucose, HbA1c, and cardiometabolic risk factors in patients with impaired fasting glucose: a randomized controlled trial. Nutrients. 2023;15(19):4233. doi:10.3390/nu15194233.

23. Fagundes GBP, Tibães JRB, Silva ML, Braga MM, Silveira ALM, Teixeira AL, et al. Efeitos metabólicos e comportamentais da alimentação com restrição de tempo em mulheres com sobrepeso e obesidade – resultados preliminares de um estudo randomizado. Nutrition [Internet]. 2022 Nov 8;111909. Disponível em: https://www.sciencedirect.com/science/article/abs/pii/S0899900722003215

24. Çelik OM, Köksal E, Aktürk M. Alimentação com restrição de tempo (16/8) e dieta com restrição energética: efeitos na qualidade da dieta, composição corporal e parâmetros bioquímicos em mulheres saudáveis com sobrepeso. BMC Nutrition. 2023 Aug 9;9(1).

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