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Research Article

Comparison of Loss to Follow-Up Rates in Randomized Clinical Trials of Nutritional Versus Pharmacological Interventions for Weight Reduction: A Systematic Review Protocol

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Abstract

Nutrition-based lifestyle changes are primary component of obesity treatment, yet they are challenging to sustain. Although randomized clinical trials (RCTs) support the effect of dietary interventions for weight loss, long-term follow-up remains difficult due to high attrition rates. Nutrition-related interventions require substantial commitment and lifestyle modifications, which may contribute to higher dropout rates compared to pharmacological trials that offer weight loss with fewer behavioral changes. This study presents the protocol for a systematic review aiming to compare loss to follow-up rates in RCTs evaluating nutritional versus pharmacological interventions for weight loss in adults with overweight or obesity. The review will be conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. Eligible studies will include RCTs comparing dietary and pharmacological strategies for weight reduction, specifically reporting loss to follow-up rates. Studies will be identified through comprehensive searches of PubMed, Embase, LILACS, Cochrane Central Register of Controlled Trials, Web of Science, and CINAHL databases without language or temporal restrictions. Data extraction and quality assessment will be performed. Results will be synthesized to compare attrition rates between intervention types. As this study involves secondary analysis of published data, ethical approval is not required. The findings will be disseminated through peer-reviewed publications, conference presentations, and clinical and academic networks, providing insights into participant retention challenges in weight loss trials and informing future clinical guidelines for obesity management.

Keywords: Weight Loss; Randomized Controlled Trials; Nutrition Intervention; Pharmacological Treatment; Attrition Rate; Systematic Review

Abbreviations

RCT: Randomized Clinical Trial; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; PROSPERO: International Prospective Register of Systematic Reviews; BMI: Body Mass Index; LILACS: Latin American and Caribbean Health Sciences Literature; CINAHL: Cumulative Index to Nursing and Allied Health Literature; Rayyan: Web-based systematic review tool; REDCap: Research Electronic Data Capture; RoB 2: Risk of Bias 2 tool; GRADE: Grading of Recommendations Assessment, Development, and Evaluation.

Introduction

Obesity is a global health challenge, affecting over 23% of adults worldwide, with its prevalence continuing to rise. Managing obesity and its complications requires comprehensive treatment approaches, where nutritional interventions play a fundamental role. Evidence-based dietary recommendations and nutritional therapy are essential components of obesity treatment. However, their long-term effectiveness requires rigorous evaluation through clinical trials [1].

Long-term follow-up in randomized clinical trials (RCTs) is crucial for assessing the effect of the intervention. Yet, performing such studies is challenging, particularly due to high attrition rates in obesity treatment trials [2]. Loss to follow-up, regardless of the reason, can impede accurate estimation of intervention effects. Methodological risks, such as inflated type 1 error from post-hoc outcome selection, selection bias, and issues arising from participant dropout, are frequently cited concerns [3,4]. Attrition jeopardizes validity, especially if dropout is associated with the measured outcome [5]. Ensuring unbiased results requires that reasons for dropout during follow-up are unrelated to study outcomes [6].

Pharmaceutical trials often benefit from higher participant retention. Many participants are highly motivated to remain under medical supervision, seeking therapeutic advantages. Contributing factors may include financial compensation, the placebo effect, and the simplicity of the intervention (e.g., taking a pill rather than implementing extensive lifestyle changes). In contrast, participants in nutritional RCTs may face unique challenges. The multifaceted nature of dietary interventions, involving behavior changes and meticulous food intake tracking, can increase participant burden. Additionally, those who do not achieve weight loss goals may feel discouraged, perceiving their lack of success as a personal failure rather than a limitation of the intervention [7].

Unlike pharmaceutical trials, dietary programs often require participants to invest substantial effort in altering habits, which may lead to higher dropout rates. Failing to meet weight loss targets might result in embarrassment or reluctance to continue follow-up visits. These challenges are compounded by the perception that failure reflects individual shortcomings, making attrition more likely in nutritional trials compared to drug trials [8].

While empirical evidence suggests that nutritional RCTs are more complex to conduct than drug trials, a direct comparison between these two types of interventions (pharmacological and non-pharmacological) in terms of dropout rates is still lacking. Therefore, this study presents a protocol for a systematic review aiming to compare loss-to-follow-up rates in RCTs evaluating nutritional versus pharmacological interventions for weight loss in adults with overweight or obesity.

Material and Methods

This review will be conducted in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA) 2020 guidelines for systematic reviews [9]. This review is registered at PROSPERO under code CRD42019127067.

Eligibility criteria

Type of studies

Only peer-reviewed interventional studies will be eligible for inclusion in this review. Specifically, we will include RCTs that evaluate either drug-based interventions versus a comparator or dietary interventions versus a comparator, with the aim of promoting weight loss in adults with overweight or obesity. To be eligible, studies must report loss to follow-up.

Loss to follow-up (also referred to as attrition or dropout) will be defined as the number of participants who discontinue participation during the course of the study. When available, dropout will be quantified both as absolute numbers and percentages, with reasons for discontinuation categorized accordingly.

We will include only parallel-design RCTs, as they are better suited to assess loss-to-follow-up rates independently for each intervention group. Cross-over RCTs will be excluded, even in cases where first-period data are reported, due to concerns that such data does not adequately reflect overall attrition. Additionally, the sample size in each period of a cross-over design is not typically powered to evaluate outcomes independently, which may compromise the validity of dropout comparisons.

We will exclude observational studies, cluster RCTs, cross-over RCTs, and RCTs published only as research letters. Only primary reports of eligible studies will be included. Secondary analyses, substudies, or multiple reports from the same trial will be screened, and in cases of discrepancy, the most complete or most recent version will be used.

Types of participants

Studies will be included if participants are adults aged 18 to 64 years with overweight or obesity, defined as a body mass index (BMI) ≥ 25 kg/m^2 at baseline. This age range was selected to align with standard definitions of adulthood and to ensure consistency in BMI classification, which differs across children, adults, and older adults.

Eligible participants must be free from comorbidities, including but not limited to diabetes, hypertension, renal disease, cancer, cardiovascular disease, or other concomitant medical conditions. The absence of such comorbidities must be explicitly stated in the original study - either in the eligibility criteria or in table 1 (baseline characteristics).

Studies will be excluded if they involve children, pregnant or lactating women, or adults outside the specified age range.

Type of interventions

The experimental interventions may include one of the following three approaches to weight loss:

- **Nutritional counseling**, delivered by a dietitian or another qualified health professional, either as a standalone intervention or in combination with co-interventions;
- **Pharmacological treatments** for weight loss, administered alone or alongside co-interventions;
- **Nutritional supplements**, such as phytotherapy or nutraceuticals, used independently or in conjunction with other interventions.

For studies involving nutritional advice, detailed information must be provided, including the frequency of consultations, the specific dietary approach employed (e.g., low-calorie, low-carbohydrate, Mediterranean), and the mode of delivery (individual or group-based). For pharmacological treatments for weight loss (e.g., semaglutide, topiramate), the type of medication (oral or injectable), dosage, and frequency of administration must be clearly reported. For nutritional supplements (e.g., phytotherapy or nutraceuticals), studies must specify the type of supplement used, dosage, and frequency of use.

In all cases, the description of the intervention should include any co-interventions, where applicable.

Type of control

The comparative intervention may consist of no treatment or standard nutritional advice provided by a dietitian or another health professional, with or without co-interventions. Studies evaluating surgical procedures or medical devices (e.g., intragastric balloon) as either experimental or control interventions for weight reduction will be excluded.

Type of outcomes

We will include trials that report weight change as the primary outcome, with a minimum follow-up period of six months from the time of randomization.

Information sources and search strategy

A comprehensive search strategy was developed in collaboration with an experienced medical librarian and refined through iterative testing for sensitivity, including the identification of known relevant studies. The following electronic databases will be searched: PubMed (MEDLINE), Embase, LILACS, Cochrane Central Register of Controlled Trials (CENTRAL), Web of Science, and CINAHL. No restrictions will be applied regarding publication date or language during the search phase. However, only studies published in English, Spanish, or Portuguese will be included in the review. Studies in other languages will be excluded. Articles in Spanish or Portuguese will be reviewed by native-speaking team members to ensure accurate data extraction and interpretation. The quality and consistency of translated content will be verified by bilingual reviewers. To enhance the comprehensiveness of the search, we will manually screen the reference lists of all included studies as well as relevant systematic reviews and meta-analyses on similar topics. The complete search strategy is provided in appendix 1.

Data records and management

Search results will be imported into a shared-access online platform (Rayyan) [10], which will be used to manage all stages of the review process. Rayyan is a web-based tool designed to support systematic reviews by facilitating collaborative screening and classification of studies according to predefined inclusion and exclusion criteria. Duplicate records will be identified and removed prior to screening. To ensure consistency in the application of eligibility criteria, the inclusion and exclusion process will be piloted on a sample of at least 10 abstracts and refined as necessary. Two reviewers will independently screen the titles and abstracts of all remaining studies for relevance. Any study deemed potentially eligible by either reviewer will proceed to full-text review. The same two reviewers will independently assess the full texts against the predefined inclusion and exclusion criteria. Disagreements regarding study eligibility will be resolved through discussion and consensus. If consensus cannot be reached, a third reviewer will be consulted to make a final determination.

Data extraction

Two reviewers will independently extract data from all studies included in the final review. Data extraction will be conducted using REDCap, a secure, web-based application designed for data collection and management, which offers a user-friendly interface and ensures data integrity throughout the process.

The following information will be extracted

- **Study identification**: author's last name, publication year, journal, trial registration number, study title.
- **Study characteristics**: type of RCT (parallel, etc.), intervention type (nutritional, pharmacological), single- or multi-center, geographic location, study start and end dates, funding source, inclusion criteria, total number of participants, allocation to intervention and control groups, and blinding status.
- **Participant characteristics**: age, sex, education level, weight, BMI at baseline, and amount of weight reduction.

Intervention details

- **Nutritional or pharmacological interventions:** description, dosage (where applicable), frequency, presence of co-interventions.
- **Comparator interventions:** e.g., no treatment, placebo, or active comparator (including drug name, dose, and frequency if applicable).
- **Delivery characteristics:** intervention provider (dietitian or other health professional), delivery method (individual, group, or mixed), and number of sessions or meetings.

Outcomes

- Number of participants analyzed at study completion.
- Study duration (in months).
- Body weight outcomes (mean and standard deviation, or median and interquartile range).
- Loss to follow-up (absolute numbers and/or proportions), with reported reasons (e.g., non-compliance, loss of contact, withdrawal of consent, adverse events).

Discrepancies between reviewers will be resolved through discussion. If disagreement persists, a third reviewer will adjudicate. For studies with missing or unclear data, we will attempt to contact the corresponding author using the email provided in the publication. If no response is received after two contact attempts (one initial email and one reminder after one week), the author will be considered unreachable. Additional attempts may be made via professional networks or phone, if feasible. Any delayed responses received prior to final data analysis will still be incorporated.

Effect measures and data synthesis

A PRISMA 2020 flow diagram will be used to illustrate the phases of study screening and selection. A narrative synthesis will be conducted to describe the characteristics of the included studies, including study design, participant demographics, and intervention details. If feasible, a meta-analysis will be performed. We will calculate proportions of loss to follow-up in the nutritional, nutritional supplement, and pharmacological intervention arms, defining loss as the number of participants lost per 100 individuals followed for one year. Different time points of attrition will be analyzed separately to identify critical periods of dropout. A random-effects model using the DerSimonian and Laird method will be applied to pool loss rates, accounting for anticipated heterogeneity across studies. Potential sources of heterogeneity will be explored through random-effects meta-regression based on study-level covariates. Specifically, we will examine associations between attrition rates and factors such as effect size, study design (parallel, multicenter vs. single-center), year of publication, country income level, study duration (<1 year vs. ≥1 year), intervention type (nutritional advice, supplements, or pharmacological treatments), mode of delivery (individual, group, or mixed), presence of co-interventions (yes vs. no), type of healthcare provider (dietitian vs. other), and participant characteristics (mean age, sex, baseline BMI). These analyses aim to identify factors associated with participant retention and inform the design of future clinical trials. The meta-regression will be weighted to account for within-study variances and residual between-study heterogeneity (i.e., heterogeneity not explained by covariates)[11]. Sensitivity analyses will exclude studies with high risk of attrition bias.

We will assess heterogeneity across studies or subgroups using Cochrane's chi-squared test and Higgins' I^2 statistic to quantify variability. I^2 >50% will be considered high heterogeneity. Publication bias will be assessed by funnel plot inspection and Egger's test [12]. Meta-analyses, subgroup analyses, heterogeneity assessment, and funnel plot construction will be performed using R version 3.3.0 (R Core Team, 2016), employing the meta package [13] for standard procedures and the metafor package [14] for advanced modeling and diagnostics.

Risk of bias assessment

Risk of bias in the included studies will be assessed at the study level using the Cochrane Collaboration's Risk of Bias tool for randomized trials (RoB) [15]. Particular attention will be paid to attrition bias and how missing outcome data were handled. Discrepancies between trial registrations and published results will be investigated by directly comparing these sources and, when necessary, contacting study authors for clarification. The following domains will be evaluated: random sequence generation, allocation concealment, blinding of participants, data collectors, outcome assessors, and data analysts, incomplete outcome data, selective outcome reporting, and other potential sources of bias, including funding, conflicts of interest, and adherence to pre-registered protocols. When methodological information is unclear or missing, study authors will be contacted for further details. Disagreements will be resolved through consensus within the review team or, if needed, adjudicated by a neutral third-party expert with experience in systematic reviews. Risk of bias results will be presented in both tabular and graphical formats, with justifications for each judgment, and will inform sensitivity analyses to assess the potential impact of bias on the review's conclusions.

Confidence in cumulative evidence

A 'Summary of Findings' table will be presented, stratified by intervention type (nutritional, supplement, and drug interventions). Levels of certainty will be assessed using the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation)

[16] approach if meta-analysis is feasible, considering factors such as imprecision, inconsistency, indirectness, publication bias, and study limitations, with particular emphasis on attrition patterns. If meta-analysis is not supported, the overall strength of the evidence will be summarized descriptively.

Ethics and dissemination

This study does not require ethical approval as it involves analysis of previously published data and does not include human subjects. The results of this systematic review will be disseminated through publication in a scientific journal and shared with relevant stakeholder groups, including clinicians, researchers, and policymakers, to maximize its reach and potential impact on practice and policy. There are no plans for updating this review or managing post-publication amendments, which will be clearly stated in the review. The anticipated timeline for completion and publication is 2026. There are no restrictions on data sharing, and data will be made available according to standard systematic review practices.

Results

The results of this systematic review will provide a comprehensive synthesis of attrition rates in randomized controlled trials comparing nutritional and pharmacological interventions for weight loss in adults with overweight or obesity. We will report pooled estimates of loss-to-follow-up proportions by intervention type (nutritional, nutraceutical, and pharmacological), standardized per 100 person-years of follow-up. Where feasible, a meta-analysis using random-effects models will be conducted to account for expected heterogeneity across studies. Subgroup analyses and meta-regression will explore potential sources of variability in attrition rates, including intervention delivery mode, study duration, type of healthcare professional involved, geographic region, and population characteristics. Publication bias will be assessed using funnel plots and Egger's test. The study selection process will be illustrated with a PRISMA flow diagram, and a "Summary of Findings" table will be developed using GRADE methodology if meta-analytical synthesis is possible; otherwise, findings will be synthesized narratively.

Discussion

This systematic review aims to address an important gap in understanding attrition rates in RCTs comparing nutritional with pharmacological interventions for weight loss in individuals with overweight or obesity. However, potential confounding factors, such as differences in funding sources between nutrition and drug trials, should be considered, as these may influence study design, participant recruitment, and retention. Given the well-documented challenges associated with maintaining long-term behavior changes (such as adherence to dietary or physical activity modifications) our hypothesis states that nutrition RCTs may experience higher attrition rates than pharmacological trials, where intervention adherence may be less demanding and limited primarily to medication intake.

To isolate attrition specifically related to weight loss interventions (rather than to the management of chronic conditions) we chose to include only adults with metabolically healthy overweight or obesity. Including individuals with comorbidities such as type 2 diabetes or hypertension could introduce bias, as their motivation to adhere to the intervention might be driven primarily by the need to manage their underlying health condition. In such cases, adherence and retention may reflect the urgency of treating the comorbidity, rather than the participant's engagement with weight loss per se. By focusing on metabolically healthy individuals, we aimed to more accurately assess attrition related to the nature of the intervention itself - particularly in the context of weight management alone.

We also acknowledge that attrition patterns may vary across geographical or cultural contexts, with different expectations, resources, and support systems influencing participants' willingness and ability to stay in the trial. Participants in nutrition-focused interventions might find the behavioral commitment challenging, possibly perceiving the need to follow specific dietary or exercise regimens as a barrier to sustained participation. However, whether attrition is indeed higher in nutrition trials compared to drug trials remains unknown. Clarifying this is crucial not only to test our

hypothesis but also to generate knowledge that can improve future trial designs, optimize retention strategies, and ultimately enhance the reliability of evidence supporting weight loss interventions for individuals with overweight and obesity.

The impact of intervention complexity and participant burden on attrition rates will be specifically examined. Findings from this review could underscore the methodological impact of attrition bias and its implications across intervention types. Even if attrition rates are similar, or unexpectedly higher in drug-based trials, understanding how participant retention varies by intervention type may provide valuable insights for designing future studies. Limitations of comparing attrition across interventions with different durations and intensities will also be acknowledged, as these could significantly influence dropout rates. Attrition affects internal and external validity of trial findings, potentially skewing estimates of intervention effects if not appropriately managed. This review may inform refinements in RCT protocols for weight loss interventions by recommending strategies to address attrition bias, such as intention-to-treat analyses and targeted retention efforts. Evidence from this review could help shape more effective study designs, supporting translation of reliable findings into clinical practice. Furthermore, findings could inform reporting guidelines for weight loss trials, especially regarding management and reporting of attrition. Additionally, this review may help establish benchmarks for acceptable attrition rates in different weight loss interventions, which is particularly relevant in light of the growing implementation of standardized care models for overweight and obesity [17].

Conclusion

Understanding attrition patterns in RCTs comparing nutritional and pharmacological interventions for weight loss is essential to improving study design and the reliability of evidence. This systematic review will provide comprehensive data on loss-to-follow-up rates, potentially revealing differences between intervention types and their impact on trial validity. Identifying factors associated with higher attrition will inform strategies to enhance participant retention, optimize trial conduct, and strengthen the evidence base supporting weight management interventions. Ultimately, the findings may contribute to the development of more robust and sustainable weight loss programs tailored to participant needs and intervention characteristics.

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Conflict of Interest

All authors declare no conflict of interest.

Declaration of generative AI in scientific writing

During the preparation of this work the authors used ChatGPT (OpenAI) in order to improve English grammar and readability. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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Appendix 1. Search strategy

NUTRITIONAL INTERVENTION on PUBMED

Search: ((("Obesity"[Mesh] OR Obesity[Title/Abstract] OR "Overweight"[Mesh] OR Overweight[Title/Abstract] OR Obese[Title/Abstract] OR "Excess weight"[Title/Abstract] OR "Excess body weight"[Title/Abstract]) AND (Nutrition[Title/Abstract] OR "Nutritional intervention"[Title/Abstract] OR "Nutritional interventions"[Title/Abstract] OR "Nutrition intervention"[Title/Abstract] OR "Nutrition interventions"[Title/Abstract] OR "Nutritional treatment"[Title/Abstract] OR "Nutrition treatment"[Title/Abstract] OR "Nutrition programmes"[Title/Abstract] OR "Nutritional programmes"[Title/Abstract] OR "Nutritional Program"[Title/Abstract] OR "Nutrition Program"[Title/Abstract] OR "Nutrition education"[Title/Abstract] OR "Nutritional status"[Title/Abstract] OR "Diet Therapy"[Mesh] OR "Diet/therapy"[Mesh] OR Diet[Title/Abstract] OR "Diet Therapy"[Title/Abstract] OR "Dietary intervention"[Title/Abstract] OR "Dietary interventions"[Title/Abstract] OR "Diet intervention"[Title/Abstract] OR "Diet interventions"[Title/Abstract] OR "Dietary therapy"[Title/Abstract] OR "Dietary treatment"[Title/Abstract] OR "Nutrition Therapy"[Mesh] OR "Nutrition Therapy"[Title/Abstract] OR "Eating patterns"[Title/Abstract] OR "Nutritional counseling"[Title/Abstract] OR "Nutrition advice"[Title/Abstract] OR "Fad diets"[Title/Abstract] OR "Hypocaloric diets"[Title/Abstract] OR "Fat replacement"[Title/Abstract] OR "Food Education"[Title/Abstract] OR "Nutrient replacement"[Title/Abstract] OR "Carbohydrate replacement"[Title/Abstract] OR "Protein replacement" [Title/Abstract] OR "Food supplementation"[Title/Abstract] OR "Meal delivery"[Title/Abstract] OR "Meal replacement"[Title/Abstract] OR "Food Supplementations"[Title/Abstract] OR "Food Supplements"[Title/Abstract] OR "Food Supplement"[Title/Abstract]))) AND ((randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract])))

NUTRITIONAL INTERVENTION on EMBASE

#1'obesity'/exp AND [embase]/lim

#2 (obesity:ab,ti OR overweight:ab,ti OR obese:ab,ti OR 'excess weight':ab,ti OR 'excess body weight':ab,ti) AND [embase]/lim

#3 'diet therapy'/exp AND [embase]/lim

#4 (nutrition:ab,ti OR 'nutritional intervention':ab,ti OR 'nutritional interventions':ab,ti OR 'nutrition intervention':ab,ti OR 'nutrition interventions':ab,ti OR 'nutritional treatment':ab,ti OR 'nutrition treatment':ab,ti OR 'nutrition programmes':ab,ti OR 'nutritional programmes':ab,ti OR 'nutritional program':ab,ti OR 'nutrition program':ab,ti OR 'nutrition education':ab,ti OR 'nutritional status':ab,ti) AND [embase]/lim

#5 (diet:ab,ti OR 'diet therapy':ab,ti OR 'dietary intervention':ab,ti OR 'dietary interventions':ab,ti OR 'diet intervention':ab,ti OR 'diet interventions':ab,ti OR 'dietary therapy':ab,ti OR 'dietary treatment':ab,ti) AND [embase]/lim

#6 ('nutrition therapy':ab,ti OR 'eating patterns':ab,ti OR 'nutritional counseling':ab,ti OR 'nutrition advice':ab,ti OR 'fad diets':ab,ti OR 'hypocaloric diets':ab,ti OR 'fat replacement':ab,ti OR 'food education':ab,ti OR 'nutrient replacement':ab,ti OR 'carbohydrate replacement':ab,ti OR 'protein replacement':ab,ti OR 'food supplementation':ab,ti OR 'meal delivery':ab,ti OR 'meal replacement':ab,ti OR 'food supplementations':ab,ti OR 'food supplements':ab,ti OR 'food supplement':ab,ti) AND [embase]/lim

#7 'randomized controlled trial'/exp AND [embase]/lim

#8 ('randomised controlled study':ab,ti OR 'randomised controlled trial':ab,ti OR 'randomized controlled study':ab,ti OR 'randomized controlled trial':ab,ti) AND [embase]/lim

#9 #1 OR #2

#10 #3 OR #4 OR #5 OR #6

#11 #7 OR #8

#12 #9 AND #10 AND #11

NUTRITIONAL INTERVENTION on Web of Science

#1((TS=(Obesity or overweight)) OR TI=(Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight")) OR AB=(Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight") #2((((TS=("NutritionTherapy")) OR TI=(Nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status")) OR AB=(Nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status")) OR TI=("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement")) OR AB=("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement")

#3 ((TS=("Diet Therapy")) OR TI=(Diet OR "Diet Therapy" OR "Dietary intervention" OR "Dietary interventions" OR "Diet intervention" OR "Diet interventions" OR "Dietary therapy" OR "Dietary treatment")) OR AB=(Diet OR "Diet Therapy" OR "Dietary intervention" OR "Dietary interventions" OR "Diet intervention" OR "Diet interventions" OR "Dietary therapy" OR "Dietary treatment")

#4 ((((TS=("randomized controlled trial")) OR TI=("randomized controlled trial" OR "randomised controlled trial" OR "randomised controlled study" OT "randomized controlled study")) OR AB=("randomized controlled trial" OR "randomised controlled trial" OR "randomised controlled study" OR "randomized controlled study")) OR TI=("controlled clinical trial")) OR AB=("controlled clinical trial")

#5 = #3 OR #2

#6 = #5 AND #4 AND #1

NUTRITIONAL INTERVENTION on CINAHL

S6	S1 AND S4 AND S5
S5	S2 OR S3
S4	MH "randomized controlled trial" OR TI ("randomised controlled study" OR "randomised controlled trial" OR "randomized controlled study" OR "randomized controlled trial" OR "random* OR "controlled clinical trial") OR AB ("randomised controlled study" OR "randomised controlled trial" OR "randomized controlled study" OR "randomized controlled trial" OR "random* OR "controlled clinical trial")
S3	MH "Diet Therapy" OR TI (Diet OR "Diet Therapy" OR "Dietary intervention" OR "Dietary interventions" OR "Diet intervention" OR "Diet interventions" OR "Dietary therapy" OR "Dietary treatment") OR AB (Diet OR "Diet Therapy" OR "Dietary intervention" OR "Dietary interventions" OR "Diet intervention" OR "Diet interventions" OR "Dietary therapy" OR "Dietary treatment")
S2	MH "Nutrition Therapy" OR TI (Nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status") OR AB (Nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status") OR TI ("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement") OR AB ("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement")
S1	MH Obesity OR MH Overweight OR TI (Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight") OR AB (Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight")

NUTRITIONAL INTERVENTION on COCHRANE LIBRARY

- MeSH descriptor: [Obesity] explode all trees
- (Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight"):kw
- MeSH descriptor: [Nutrition Therapy] explode all trees
- (Nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status")
- ("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement")
- MeSH descriptor: [Diet Therapy] explode all trees
- ("Diet Therapy" OR "Dietary intervention" OR "Dietary interventions" OR "Diet intervention" OR "Diet interventions" OR "Dietary therapy" OR "Dietary treatment")
- #1 or #2
- #3 or #4 or #5 or #6 or #7
- #8 and #9

NUTRITIONAL INTERVENTION on LILACS

mh:("obesity" OR "overweight") OR ti:(obesity OR obese OR "Excess weight" OR "Excess body weight") OR ab:(obesity OR obese OR "Excess weight" OR "Excess body weight") AND mh:("nutrition therapy" OR "diet therapy") OR ti:(nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status") OR ab:(nutrition OR "Nutritional intervention" OR "Nutritional interventions" OR "Nutrition intervention" OR "Nutrition interventions" OR "Nutritional treatment" OR "Nutrition treatment" OR "Nutrition programmes" OR "Nutritional programmes" OR "Nutritional Program" OR "Nutrition Program" OR "Nutrition education" OR "Nutritional status") OR ti:(diet OR "Diet Therapy" OR "Dietary intervention" OR "Dietary interventions") OR ab:(diet OR "Diet Therapy" OR "Dietary intervention" OR "Dietary interventions") OR ti:("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement") OR ab:("Nutrition Therapy" OR "Eating patterns" OR "Nutritional counseling" OR "Nutrition advice" OR "Fad diets" OR "Hypocaloric diets" OR "Fat replacement" OR "Food Education" OR "Nutrient replacement" OR "Carbohydrate replacement" OR "Protein replacement" OR "Food supplementation" OR "Meal delivery" OR "Meal replacement" OR "Food Supplementations" OR "Food Supplements" OR "Food Supplement") AND (db:("LILACS") AND type_of_study:("clinical_trials"))

DRUG INTERVENTION on PUBMED

((("Obesity"[Mesh] OR Obesity[Title/Abstract] OR "Overweight"[Mesh] OR Overweight[Title/Abstract] OR Obese[Title/Abstract] OR "Excess weight"[Title/Abstract] OR "Excess body weight"[Title/Abstract]) AND ("Drug Therapy"[Mesh] OR "Drug Therapy"[Title/Abstract] OR "Drug Therapies"[Title/Abstract] OR "Anti-Obesity Agents/therapeutic use"[Mesh] OR "Anti Obesity Agents"[Title/Abstract] OR "Anti-Obesity Drugs"[Title/Abstract] OR "Anti Obesity Drugs"[Title/Abstract] OR "Antiobesity Drugs"[Title/Abstract] OR "Antiobesity Agents"[Title/Abstract] OR "Weight-Loss Agents"[Title/Abstract] OR "Weight-Loss Drugs"[Title/Abstract] OR "Pharmacologic therapy"[Title/Abstract] OR "Drug intervention"[Title/Abstract] OR "Drug interventions"[Title/Abstract] OR Pharmacotherapy[Title/Abstract] OR "Pharmaceutical therapy"[Title/Abstract] OR "Pharmacological treatments"[Title/Abstract] OR "Pharmacological treatment"[Title/Abstract] OR "Orlistat"[Mesh] OR Xenical[Title/Abstract] OR Orlistat[Title/Abstract] OR "Lorcaserin" [Supplementary Concept] OR Lorcaserin[Title/Abstract] OR Belviq[Title/Abstract] OR "Sibutramine"[Supplementary Concept] OR Sibutramine[Title/Abstract] OR "Semaglutide"[Supplementary Concept] OR Semaglutide[Title/Abstract] OR Ozempic[Title/Abstract] OR "Liraglutide"[Mesh] OR Liraglutide[Title/Abstract] OR Saxenda[Title/Abstract] OR "Phentermine"[Mesh] OR Phentermine[Title/Abstract] OR "Topiramate"[Mesh] OR Topiramate[Title/Abstract] OR Qsymia[Title/Abstract] OR "Naltrexone-Bupropion combination"[Supplementary Concept] OR "Naltrexone-Bupropion combination"[Title/Abstract] OR Contrave[Title/Abstract]))) AND ((randomized controlled trial[Publication Type] OR (randomized[Title/Abstract] AND controlled[Title/Abstract] AND trial[Title/Abstract]))) Sort by: Most Recent

DRUG INTERVENTION on EMBASE

- #1 'obesity'/exp AND [embase]/lim
- #2 (obesity:ab,ti OR overweight:ab,ti OR obese:ab,ti OR 'excess weight':ab,ti OR 'excess body weight':ab,ti) AND [embase]/lim
- #3 'drug therapy'/exp AND [embase]/lim
- #4 'antiobesity agent'/exp/dd_dt AND [embase]/lim
- #5 'antiobesity agent'/exp AND [embase]/lim
- #6 'tetrahydrolipstatin'/exp AND [embase]/lim
- #7 'lorcaserin'/exp AND [embase]/lim
- #8 'sibutramine'/exp AND [embase]/lim

- #9 'semaglutide'/exp AND [embase]/lim
- #10 'liraglutide'/exp AND [embase]/lim
- #11 'phentermine'/exp AND [embase]/lim
- #12 'topiramate'/exp AND [embase]/lim
- #13 'amfebutamone plus naltrexone'/exp AND [embase]/lim
- #14 ('drug therapy':ab,ti OR 'drug therapies':ab,ti OR 'anti-obesity agents':ab,ti OR 'anti-obesity drugs':ab,ti OR 'antiobesity drugs':ab,ti OR 'antiobesity agents':ab,ti OR 'weight-loss agents':ab,ti OR 'weight-loss drugs':ab,ti OR 'pharmacologic therapy':ab,ti OR 'drug intervention':ab,ti OR 'drug interventions':ab,ti OR pharmacotherapy:ab,ti OR 'pharmaceutical therapy':ab,ti OR 'pharmacological treatments':ab,ti OR 'pharmacological treatment':ab,ti) AND [embase]/lim
- #15 (xenical:ab,ti OR orlistat:ab,ti OR lorcaserin:ab,ti OR belviq:ab,ti OR sibutramine:ab,ti OR semaglutide:ab,ti OR ozempic:ab,ti OR liraglutide:ab,ti OR saxenda:ab,ti OR phentermine:ab,ti OR topiramate:ab,ti OR qsymia:ab,ti OR 'naltrexone-bupropion':ab,ti OR contrave:ab,ti) AND [embase]/lim
- #16 #1 OR #2
- #17 #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR
- #14 OR #15
- #18 #16 AND #17
- #19 'randomized controlled trial'/exp AND [embase]/lim
- #20 ('randomised controlled study':ab,ti OR 'randomised controlled trial':ab,ti OR 'randomized controlled study':ab,ti OR 'randomized controlled trial':ab,ti) AND [embase]/lim
- #21 #19 OR #20
- #22 #18 AND #21

DRUG INTERVENTION on WEB OF SCIENCE

- TS=(Obesity OR Overweight)
- TI=(Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight")
- AB=(Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight")
- TS=("Drug Therapy" OR "Anti-Obesity Agents")
- TI=("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Anti-obesity Agents" OR "Weight-Loss Agents" OR "Weight Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR Pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment")
- AB=("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Anti-obesity Agents" OR "Weight-Loss Agents" OR "Weight-Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR Pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment")
- TS=(Orlistat OR Lorcaserin OR Sibutramine OR Semaglutide OR Liraglutide OR Phentermine OR Topiramate OR Naltrexone-Bupropion)
- TI=(Xenical OR Orlistat OR Lorcaserin OR Belviq OR Sibutramine OR Semaglutide OR Ozempic OR Liraglutide OR Saxenda OR Phentermine OR Topiramate OR Qsymia OR "Naltrexone-Bupropion" OR Contrave)

- AB=(Xenical OR Orlistat OR Lorcaserin OR Belviq OR Sibutramine OR Semaglutide OR Ozempic OR Liraglutide OR Saxenda OR Phentermine OR Topiramate OR Qsymia OR "Naltrexone-Bupropion" OR Contrave)
- ((((TS=("randomized controlled trial")) OR TI=("randomized controlled trial" OR "randomised controlled trial")) OR AB=("randomized controlled trial" OR "randomised controlled trial" OR random*)) OR TI=("controlled clinical trial")) OR AB=("controlled clinical trial")
- #11 = #3 OR #2 OR #1
- #12 = #9 OR #8 OR #7 OR #6 OR #5 OR #4
- #13 = #12 AND #11
- #14 = #13 AND #10

DRUG INTERVENTION on CINAHL

S12	S9 AND S10 AND S11
S11	S7 OR S8
S10	S3 OR S4 OR S5 OR S6
S9	S1 OR S2
S8	TI (("randomised controlled study" OR "randomised controlled trial" OR "randomized controlled study" OR "randomized controlled trial" OR "random* OR "controlled clinical trial")) OR AB (("randomised controlled study" OR "randomised controlled trial" OR "randomized controlled study" OR "randomized controlled trial" OR "random* OR "controlled clinical trial"))
S7	MH randomized controlled trials
S6	TI ("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Antiobesity Agents" OR "Weight-Loss Agents" OR "Weight-Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR Pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment") OR AB ("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Antiobesity Agents" OR "Weight-Loss Agents" OR "Weight-Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR Pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment")
S5	TI (Xenical OR Orlistat OR Lorcaserin OR Belviq OR Sibutramine OR Semaglutide OR Ozempic OR Liraglutide OR Saxenda OR Phentermine OR Topiramate OR Qsymia OR "Naltrexone-Bupropion" OR Contrave) OR AB (Xenical OR Orlistat OR Lorcaserin OR Belviq OR Sibutramine OR Semaglutide OR Ozempic OR Liraglutide OR Saxenda OR Phentermine OR Topiramate OR Qsymia OR "Naltrexone-Bupropion" OR Contrave)
S4	MH Orlistat OR Lorcaserin OR Sibutramine OR Semaglutide OR Liraglutide OR Phentermine OR Topiramate OR Naltrexone-Bupropion combination
S3	MH drug therapy OR MH anti-obesity agents
S2	TI (Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight") OR AB (Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight")
S1	MH obesity OR MH Overweight

DRUG INTERVENTION on COCHRANE LIBRARY

MeSH descriptor: [Obesity] explode all trees

- (Obesity OR Overweight OR Obese OR "Excess weight" OR "Excess body weight"):kw
- MeSH descriptor: [Overweight] explode all trees
- MeSH descriptor: [Drug Therapy] explode all trees
- MeSH descriptor: [Anti-Obesity Agents] explode all trees and with qualifier(s): [therapeutic use - TU]

- MeSH descriptor: [Anti-Obesity Agents] explode all trees
- ("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Antiobesity Agents" OR "Weight-Loss Agents" OR "Weight-Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR Pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment"):ab
- MeSH descriptor: [Orlistat] explode all trees
- MeSH descriptor: [Liraglutide] explode all trees
- MeSH descriptor: [Phentermine] explode all trees
- MeSH descriptor: [Topiramate] explode all trees
- (Xenical OR Orlistat OR Lorcaserin OR Belviq OR Sibutramine OR Semaglutide OR Ozempic OR Liraglutide OR Saxenda OR Phentermine OR Topiramate OR Qsymia OR "Naltrexone-Bupropion" OR Contrave):ti,ab,kw
- #1 or #2 or #3
- {OR #4-#12}
- #13 and #14

DRUG INTERVENTION on LILACS

mh:("obesity" OR "overweight") OR ti:(obesity OR obese OR "Excess weight" OR "Excess body weight") AND mh:("drug therapy" OR "anti-obesity agents") OR ti:("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Antiobesity Agents" OR "Weight-Loss Agents" OR "Weight-Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment") OR ab: ("Drug Therapy" OR "Drug Therapies" OR "Anti-Obesity Agents" OR "Anti-Obesity Drugs" OR "Antiobesity Drugs" OR "Antiobesity Agents" OR "Weight-Loss Agents" OR "Weight-Loss Drugs" OR "Pharmacologic therapy" OR "Drug intervention" OR "Drug interventions" OR pharmacotherapy OR "Pharmaceutical therapy" OR "Pharmacological treatments" OR "Pharmacological treatment") OR ti:(xenical OR orlistat OR lorcaserin OR belviq OR sibutramine OR semaglutide OR ozempic OR liraglutide OR saxenda OR phentermine OR topiramate OR qsymia OR "Naltrexone-Bupropion" OR contrave) OR ab:(xenical OR orlistat OR lorcaserin OR belviq OR sibutramine OR semaglutide OR ozempic OR liraglutide OR saxenda OR phentermine OR topiramate OR qsymia OR "Naltrexone-Bupropion" OR contrave) AND (db:("LILACS") AND type_of_study:("clinical_trials"))