Systematic review

1. * Review title.

Give the working title of the review, for example the one used for obtaining funding. Ideally the title should state succinctly the interventions or exposures being reviewed and the associated health or social problems. Where appropriate, the title should use the PI(E)COS structure to contain information on the Participants, Intervention (or Exposure) and Comparison groups, the Outcomes to be measured and Study designs to be included.

The Impact of Exercise and Pharmacological Interventions on Visceral Adiposity: A Systematic Review and Meta-Analysis of Long-term Randomized Controlled Trials

2. Original language title.

For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

English

3. * Anticipated or actual start date.

Give the date when the systematic review commenced, or is expected to commence.

01/09/2015

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

01/05/2018

5. * Stage of review at time of this submission.

Indicate the stage of progress of the review by ticking the relevant Started and Completed boxes. Additional information may be added in the free text box provided.

Please note: Reviews that have progressed beyond the point of completing data extraction at the time of initial registration are not eligible for inclusion in PROSPERO. Should evidence of incorrect status and/or completion date being supplied at the time of submission come to light, the content of the PROSPERO record will be removed leaving only the title and named contact details and a statement that inaccuracies in the stage of the review date had been identified.

This field should be updated when any amendments are made to a published record and on completion and publication of the review.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
Data extraction	Yes	Yes
Risk of bias (quality) assessment	Yes	Yes
Data analysis	Yes	Yes

Provide any other relevant information about the stage of the review here (e.g. Funded proposal, protocol not yet finalised).

6. * Named contact.

The named contact acts as the guarantor for the accuracy of the information presented in the register record.
Ian Neeland

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Dr. Neeland

7. * Named contact email.

Give the electronic mail address of the named contact.
ian.neeland@utsouthwestern.edu

8. Named contact address

Give the full postal address for the named contact.
5323 Harry Hines Blvd.
Dallas, Texas, USA 75390-8830

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.
214-645-1267

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.
UT Southwestern Medical Center

Organisation web address:

11. Review team members and their organisational affiliations.

Give the title, first name, last name and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong.

Dr Ian Neeland. UT Southwestern Medical Center
Dr Shreya Rao. UT Southwestern Medical Center
Dr Ambarish Pandey. UT Southwestern Medical Center
Dr Sushil Garg. The University of Minnesota Medical Center

Dr Bryan Park. UT Southwestern Medical Center
Ms Helen Mayo. UT Southwestern Medical Center
Dr Pierre Despres. Québec Heart and Lung Institute
Dr Dharam Kumbhani. UT Southwestern Medical Center
Dr James de Lemos. UT Southwestern Medical Center

12. * Funding sources/sponsors.

Give details of the individuals, organizations, groups or other legal entities who take responsibility for initiating, managing, sponsoring and/or financing the review. Include any unique identification numbers assigned to the review by the individuals or bodies listed.

None

13. * Conflicts of interest.

List any conditions that could lead to actual or perceived undue influence on judgements concerning the main topic investigated in the review.

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members.

15. * Review question.

State the question(s) to be addressed by the review, clearly and precisely. Review questions may be specific or broad. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS where relevant.

What are the relative efficacies of monitored exercise regimens and pharmacotherapies in reducing visceral adiposity?

16. * Searches.

Give details of the sources to be searched, search dates (from and to), and any restrictions (e.g. language or publication period). The full search strategy is not required, but may be supplied as a link or attachment.

A comprehensive computerized search of OVID, MEDLINE, Scopus, Web of Science, the Cochrane Library, ClinicalTrials.gov, the New York Academy of Science Grey Literature Report, and OpenGrey was conducted for human studies on adults over 18 years of age published in English from date of inception to September 2015 with the expertise of a medical librarian. This was supplemented by hand searching additional relevant articles identified through March 2016 and review of reference lists of selected articles.

17. URL to search strategy.

Give a link to the search strategy or an example of a search strategy for a specific database if available (including the keywords that will be used in the search strategies).

https://www.crd.york.ac.uk/PROSPEROFILES/91187_STRATEGY_20180320.pdf

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

Yes I give permission for this file to be made publicly available

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied. This could include health and wellbeing outcomes.

In this study we aim to assess the relative efficacies of exercise and pharmacologic interventions on reduction in visceral adiposity.

19. * Participants/population.

Give summary criteria for the participants or populations being studied by the review. The preferred format includes details of both inclusion and exclusion criteria.
Included participants are overweight and obese adults over the age of 18. Studies of specific comorbid conditions associated with weight gain (including polycystic ovarian syndrome and growth hormone deficiency) were excluded.

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the nature of the interventions or the exposures to be reviewed.
Interventions studied include fully- or partially-supervised exercise regimens maintained over a minimum of 6 months. Pharmacologic interventions must include current FDA approved or previously considered weight loss agents, or agents commonly used for the treatment of weight loss or components of the metabolic syndrome including those used in the treatment of diabetes and cardiovascular disease. Pharmacologic interventions must be sustained over a minimum of 6 months.

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the main subject/topic of the review will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.
Comparator groups include placebo controls as well as control groups exposed to lifestyle counseling.

22. * Types of study to be included.

Give details of the types of study (study designs) eligible for inclusion in the review. If there are no restrictions on the types of study design eligible for inclusion, or certain study types are excluded, this should be stated. The preferred format includes details of both inclusion and exclusion criteria.
Randomized control trials

23. Context.

Give summary details of the setting and other relevant characteristics which help define the inclusion or exclusion criteria.
Studies included in this analysis were required to have: (1) a randomized, placebo controlled trial (RCT) design, (2) visceral adipose tissue (VAT) area (cm2) as a primary or secondary outcome, measured by computed tomography (CT) or magnetic resonance imaging (MRI), (3) sustained intervention for at least 6 months, (4) fully- or partially-monitored exercise interventions (for exercise studies), and (5) current FDA approved or previously considered weight loss agents, or agents commonly used for the treatment of weight loss or components of the metabolic syndrome including those used in the treatment of diabetes and cardiovascular disease (for pharmacologic studies).

24. * Primary outcome(s).

Give the pre-specified primary (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.
Change in visceral adiposity area measured by CT or MRI.

Timing and effect measures

25. * Secondary outcome(s).

List the pre-specified secondary (additional) outcomes of the review, with a similar level of detail to that required for primary outcomes. Where there are no secondary outcomes please state ‘None’ or ‘Not

applicable' as appropriate to the review
Subcutaneous adipose tissue (cm2), weight (kilograms), BMI (kg/cm2)

Timing and effect measures

26. Data extraction (selection and coding).

Give the procedure for selecting studies for the review and extracting data, including the number of researchers involved and how discrepancies will be resolved. List the data to be extracted.
For each study, data were extracted for baseline characteristics of the study population including mean age, sex, weight (kg), BMI (kg/m2), race/ethnicity, waist circumference (cm), and the prevalence of comorbid diabetes. Study methodology including duration and modality of intervention, with associated measures of variance was also extracted. For studies not reporting outcomes as a mean difference between baseline and endpoint measurements, outcomes were calculated using reported baseline and endpoint data.

27. * Risk of bias (quality) assessment.

State whether and how risk of bias will be assessed (including the number of researchers involved and how discrepancies will be resolved), how the quality of individual studies will be assessed, and whether and how this will influence the planned synthesis.
Quality of the included studies were evaluated for risk of bias quantitatively using the Jadad scale and qualitatively using the Cochrane risk of bias assessment tool.

28. * Strategy for data synthesis.

Give the planned general approach to synthesis, e.g. whether aggregate or individual participant data will be used and whether a quantitative or narrative (descriptive) synthesis is planned. It is acceptable to state that a quantitative synthesis will be used if the included studies are sufficiently homogenous.
Tabular data are used as individual data were not available. Quantitative analysis of VAT change from baseline to follow-up will be summarized as standardized mean difference with 95% confidence intervals reported. Groups will be compared using random-effects models. Interventions are stratified by exercise regimen and sex.

29. * Analysis of subgroups or subsets.

Give details of any plans for the separate presentation, exploration or analysis of different types of participants (e.g. by age, disease status, ethnicity, socioeconomic status, presence or absence or co-morbidities); different types of intervention (e.g. drug dose, presence or absence of particular components of intervention); different settings (e.g. country, acute or primary care sector, professional or family care); or different types of study (e.g. randomised or non-randomised).
Sensitivity analysis will be performed based on study quality.

30. * Type and method of review.

Select the type of review and the review method from the lists below. Select the health area(s) of interest for your review.

Type of review

Cost effectiveness
No

Diagnostic
No

Epidemiologic
No

Individual patient data (IPD) meta-analysis
No

Intervention

No

Meta-analysis
Yes

Methodology
No

Network meta-analysis
No

Pre-clinical
No

Prevention
No

Prognostic
No

Prospective meta-analysis (PMA)
No

Qualitative synthesis
No

Review of reviews
No

Service delivery
No

Systematic review
No

Other
No

Health area of the review

Alcohol/substance misuse/abuse
No

Blood and immune system
No

Cancer
No

Cardiovascular
Yes

Care of the elderly
No

Child health
No

Complementary therapies
No

Crime and justice
No

Dental
No

Digestive system
No

Ear, nose and throat
No

Education
No

Endocrine and metabolic disorders
No

Eye disorders
No

General interest
No

Genetics
No

Health inequalities/health equity
No

Infections and infestations
No

International development
No

Mental health and behavioural conditions
No

Musculoskeletal
No

Neurological
No

Nursing
No

Obstetrics and gynaecology
No

Oral health
No

Palliative care
No

Perioperative care
No

Physiotherapy
No

Pregnancy and childbirth
No

Public health (including social determinants of health)
No

Rehabilitation
No

Respiratory disorders
No

Service delivery
No

Skin disorders
No

Social care
No

Surgery
No

Tropical Medicine
No

Urological
No

Wounds, injuries and accidents
No

Violence and abuse
No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.

English

There is not an English language summary

32. Country.

Select the country in which the review is being carried out from the drop down list. For multi-national collaborations select all the countries involved.
United States of America

33. Other registration details.

Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or The Joanna Briggs Institute) together with any unique identification number assigned. (N.B. Registration details for Cochrane protocols will be automatically entered). If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

Give the citation and link for the published protocol, if there is one

Give the link to the published protocol.

Alternatively, upload your published protocol to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Give brief details of plans for communicating essential messages from the review to the appropriate audiences.

Do you intend to publish the review on completion?

Yes

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords will help users find the review in the Register (the words do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

37. Details of any existing review of the same topic by the same authors.

Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible.

38. * Current review status.

Review status should be updated when the review is completed and when it is published.
Please provide anticipated publication date

Review_Completed_not_published

39. Any additional information.

Provide any other information the review team feel is relevant to the registration of the review.

40. Details of final report/publication(s).

This field should be left empty until details of the completed review are available.

Give the link to the published review.