INPLASY PROTOCOL

To cite: Gutierrez-Arias et al. Strategies used to manage overlap of primary study data by exercise-related overviews authors. Protocol for a systematic methodological review. Inplasy protocol 202250161. doi: 10.37766/inplasy2022.5.0161

Received: 28 May 2022

Published: 28 May 2022

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Support: **None.**

Review Stage at time of this submission: **Preliminary searches.**

Conflicts of interest:
None declared.

Strategies used to manage overlap of primary study data by exercise-related overviews authors. Protocol for a systematic methodological review

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Review question / Objective: **This methodological review aims to find out how often strategies for handling overlapping data from primary studies are used across the systematic reviews considered by overviews authors focused on exercise-related interventions in different health conditions. Secondarily, we aim to describe the overlap strategies used, the authors' acknowledgment of not using any management strategy as a methodological weakness, and the congruence between the protocol and the final published overview in terms of overlap management.**
Study designs to be included: **We will include overviews that consider SRs with or without meta-analysis (MA), without distinction of the methodological design of the primary studies included. The definition of SR adopted by the authors of the overviews will not be considered as an eligibility criterion. Overviews that also include primary studies not considered in the selected SRs will not be excluded.An overview is defined as any study: 1) aimed at synthesising general information, methods, and outcome data from SRs, 2) that makes explicit the inclusion and exclusion criteria for SRs, 3) that includes an explicit sear.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 May 2022 and was last updated on 28 May 2022 (registration number INPLASY202250161).

INTRODUCTION

Review question / Objective: **This methodological review aims to find out how often strategies for handling overlapping data from primary studies are used across the systematic reviews considered by overviews authors focused on exercise-related interventions in different health conditions. Secondarily, we aim to describe the overlap strategies used, the authors' acknowledgment of not using any management strategy as a methodological**

weakness, and the congruence between the protocol and the final published overview in terms of overlap management.

Rationale: The growth in research evidence makes it difficult for clinicians to keep up to date and use interventions based on the best available evidence. Overviews, also known as umbrella reviews, can help clinicians make sense of duplicated SRs on the same topic. Overviews synthesize information and data from multiple similar systematic reviews (SRs) to guide health decision-making. Conducting overviews of health interventions is aimed at mapping the available evidence, establishing the effects of different interventions on the same health condition or population, examining the effects of an intervention on different health conditions or populations, and determining the reasons for discordance of SRs with or without meta-analyses (MAs) that answer the same research question. Intuitively, one might think that conducting an overview presents the same steps as conducting an SR with MA; however, overviews present their challenges stemming from the fact that the unit of analysis is the SR. When conducting an overview, one of the most conflicting methodological issues is the overlap of primary studies included across SRs with or without MAs. When one or more primary studies are included in two or more SRs with or without MA, the results and conclusions of the overviews may be biased. Overlapping data from the same primary studies may include overlapping in risk of bias and certainty of evidence assessments (e.g., Grading of Recommendations, Assessment, Development and Evaluations (GRADE)), or overlapping in the determination of the effect of a specific intervention and other MA outcomes such as heterogeneity (e.g., I2). Overlap in the pooled effect estimates across SRs may lead to overly precise effect estimates in the overview.

Condition being studied: We aim to identify the strategies used to manage data from overlapping primary studies selected by SRs included in overviews. However, the absence of any strategy for handling overlap will not determine the exclusion of overviews (see section "Main outcome(s)"). Strategies should be clearly specified in the main text of the overviews and may be in the methods or results section, considering all possible methodological strategies that address overlap in the primary study data. Strategies that address overlap may be aimed at quantifying overlap (e.g., corrected covered area (CCA)), visually presenting overlap (e.g., matrix, Venn and Euler diagrams), and avoid duplicate information by using one or more decision algorithms (e.g., quality of SRs, comprehensive SRs, up-to-datedness of SRs, statistical methods).

METHODS

Search strategy: The search strategy used for MEDLINE (Ovid) will be:

① exp Exercise/

② exp Physical Fitness/

③ exp Physical Exertion/

④ exp Physical Therapy Modalities/

⑤ exp Exercise Therapy/

⑥ exp Rehabilitation/

⑦ (rehabilitat$ or fitness$ or exercis$ or physical$ or train$ or physiotherap$ or kinesiotherap$).ti,ab.

⑧ aerobic$.ti,ab.

⑨ (muscle$ adj3 resist$).ti,ab.

⑩ or/1-9

⑪ ((overview$ or review or synthesis or summary or cochrane or analysis) and (reviews or metaanalyses or articles or umbrella)).ti. or umbrella review.ab. or (meta-review or metareview).ti,ab.

⑫ (overview$ or reviews).mp. and (systematic or cochrane).ti.

⑬ (reviews adj2 meta).ab.

⑭ (reviews adj2 (published or quality or included or summar$)).ab.

⑮ cochrane reviews.ab.

⑯ (evidence and (reviews or meta-analyses)).ti.

⑰ or/11-16

⑱ and/10,17

*This strategy will be adapted for Embase (Ovid), Cochrane Database of Systematic Reviews (Cochrane Library), Epistemonikos, and SR protocol registries.

Participant or population: Overviews including SRs that have considered primary studies that have studied any exercise-based intervention, where exercise is understood as a subcategory of physical activity that is planned, structured, repetitive, and purposefully focused on improving or maintaining one or more components of physical fitness, will be included. These overviews can focus on including only SRs related to exercise-based interventions, as well as other non-exercise interventions.Overviews that consider exercise training-based interventions that are applied both preventively and in the recovery phase, and that are delivered either as a stand-alone intervention, as part of a comprehensive rehabilitation programme, or as an adjunct to other medical interventions in which exercise is the main component, will be included.Furthermore, the inclusion of overviews will not be limited according to the context in which the exercise-based interventions were applied (e.g., primary care, specialised care) or whether they were delivered face-to-face, remotely, or mixed.Overviews that include SRs that consider physical activity as an intervention, understood as "any bodily movement produced by skeletal muscles that requires energy expenditure" according to the World Health Organisation, will be excluded.

Intervention: We aim to identify the strategies used to manage data from overlapping primary studies selected by SRs included in overviews. However, the absence of any strategy for handling overlap will not determine the exclusion of overviews (see section "Main outcome(s)").Strategies should be clearly specified in the main text of the overviews and may be in the methods or results section, considering all possible methodological strategies that address overlap in the primary study data. Strategies that address overlap may be aimed at quantifying overlap (e.g., corrected covered area (CCA)), visually presenting overlap (e.g., matrix, Venn and Euler diagrams), and avoid duplicate information by using one or more decision algorithms (e.g., quality of SRs, comprehensive SRs, up-to-datedness of SRs, statistical methods).

Comparator: Not applicable.

Study designs to be included: We will include overviews that consider SRs with or without meta-analysis (MA), without distinction of the methodological design of the primary studies included. The definition of SR adopted by the authors of the overviews will not be considered as an eligibility criterion. Overviews that also include primary studies not considered in the selected SRs will not be excluded.An overview is defined as any study: 1) aimed at synthesising general information, methods, and outcome data from SRs, 2) that makes explicit the inclusion and exclusion criteria for SRs, 3) that includes an explicit sear.

Eligibility criteria: Studies will be eligible if they meet the following inclusion criteria for study design and population. Due to the aim of this methodological review, the intervention and outcomes will not determine the inclusion of studies, and the comparator or control intervention will not be considered as it is not applicable.

Information sources: The databases to be consulted will be MEDLINE (Ovid), Embase (Ovid), The Cochrane Database of Systematic Reviews (Cochrane Library), and Epistemonikos. In addition, we will search protocol registries of SRs such as INPLASY (https://inplasy.com/), PROSPERO (https://www.crd.york.ac.uk/PROSPERO/), and OSF Registries (https://osf.io/registries), and follow up protocols published in scientific journals (e.g., BMC Systematics Reviews, BMJ Open).

Main outcome(s): The presence or absence of overlap management strategies of the primary studies included in the SRs will be considered as the main outcome,

expressed as the absolute number and proportion of overviews that include any strategy out of the total number of overviews that meet the eligibility criteria of this methodological review.

Additional outcome(s): Two aspects will be considered as secondary outcomes:
1) Acknowledgement of the limitation of the overview's conduction: we will assess whether the overviews authors that did not include any strategy for managing primary study overlap considered this limitation in their discussion or conclusion.
2) Congruence between planning and conducting the overview: we will review available registry entries (e.g., PROSPERO, INPLASY) or published protocols in scientific journals (e.g., BMC Systematics Reviews, BMJ Open) of all overviews included in this SR to determine whether management of primary study overlap had been considered in the planning phase of the overviews and to determine the congruence between the methods proposed in the protocols and those finally used.

Data management: Two reviewers will independently screen the records identified through the search strategy. In the first instance, the titles and abstracts will be reviewed, and then the full texts of the records will be checked for compliance with all eligibility criteria. The Rayyan application will be used for this stage. The extraction of information from the included overviews will also be carried out independently by two reviewers. A standardized extraction form will be used which will contain data related to the basic information of the overviews (title, journal, year, authors, objectives, number of SRs included), methodological aspects (databases consulted, date of search, type of synthesis of results, instruments for assessing the risk of bias). In addition, data will be extracted to answer the outcomes of this methodological review, such as the type of strategy used (quantifying overlap (e.g., CCA); visually presenting overlap (e.g., matrix, Venn and Euler diagrams); and strategies to avoid duplicate information (e.g., quality of SRs, comprehensive SRs, up-to-datedness of SRs, statistical methods such as sensitivity analysis), and the step in the conduct of the overview where the strategy has been deployed or used (e.g., data extraction step, synthesis step). And the level at which the strategies were applied, i.e. whether it was at the level of SR or reported outcomes, will also be extracted. In addition, the impact factor (IF) of the journal at the time of publication of the overviews will be recorded. This will be extracted from the journals' official websites or from Web of Science (https://www.webofscience.com/). If more than one record or publication exists for an overview, the most up-to-date version will be considered for analysis. In the event of disagreements in the screening and data extraction phase, these will be resolved by consensus among the reviewers, or ultimately by a third reviewer.

Quality assessment / Risk of bias analysis: No risk of bias assessment will be conducted.

Strategy of data synthesis: The results of the study selection will be schematized through a PRISMA-type flow chart. In addition, the characteristics of the overviews included, as well as data related to the primary and secondary outcomes, will be presented in narrative form, and through tables and figures. Descriptive statistics will be used to quantify the number of overviews using overlap strategies, whether the strategies were used at the level of SRs or at the level of each reported outcome, and will be organized by the type of strategy used. We will also assess whether the overlap strategy was successful in resolving overlap at the following steps: risk of bias assessment, certainty of the evidence (e.g., GRADE), and the synthesis step.

Subgroup analysis: Differences in the percentage of overviews that include overlap management strategies, the type of strategies used, the recognition of the weakness of not using any strategy, and the congruence between the protocols and the methodology finally used among journals with and without IF will be

assessed. In addition, this analysis will be repeated for IF journals, considering the median or quartiles of the IF of the journals at the time of publication of the overviews to form 2 or 4 groups respectively, depending on the number of overviews included in this methodological review.

Sensitivity analysis: No sensitivity analysis will be conducted.

Language: No language restriction will be applied in the search.

Country(ies) involved: Chile, Germany, Canada and Spain.

Keywords: Overviews of systematic reviews; Umbrella review; Overlap; Review methods; Exercise; Rehabilitation.

Dissemination plans: The findings of this review will be presented at scientific congresses and published as one or more studies in peer-review scientific journals related to rehabilitation or to methodological aspects associated with evidence synthesis.

Contributions of each author:

Author 1 - Ruvistay Gutierrez-Arias - Conception of the methodological review, designing and drafting the protocol and drafting the manuscript.
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