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

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Manuscripts

1 **Strategies used to manage overlap of primary study data by exercise-related overviews.**

2 **Protocol for a systematic methodological review.**

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35 **Competing interests**

36 All authors declare no competing interests.

38 **Data sharing**

39 Not applicable

40 **Abstract**

41 **Introduction:** One of the most conflicting methodological issues when conducting an
42 overview is the overlap of primary studies included across systematic reviews (SRs). Overlap
43 in the pooled effect estimates across SRs may lead to overly precise effect estimates in the
44 overview. SRs that focus on exercise-related interventions are often included in overviews
45 aimed at grouping and determining the effectiveness of various interventions for the
46 management of specific health conditions.

47 **Objective:** The aim of this systematic methodological review is to describe the strategies used
48 by authors of overviews focusing on exercise-related interventions to manage the overlap of
49 primary studies.

50 **Materials and methods:** A comprehensive search strategy has been developed for different
51 databases and their platforms. The databases to be consulted will be MEDLINE (Ovid),
52 Embase (Ovid), The Cochrane Database of Systematic Reviews (Cochrane Library), and
53 Epistemonikos. Two reviewers will independently screen the records identified through the
54 search strategy and will extract the information from the included overviews. The frequency
55 and the type of overlap management strategies of the primary studies included in the SRs
56 will be considered as the main outcome. In addition, the recognition of the lack of use of any
57 overlap management strategy and the congruence between planning and conducting the
58 overview focusing on overlap management strategies will be assessed. A subgroup analysis
59 will be carried out according to the journal impact factor, year of publication, and compliance
60 with the PRIOR statement.

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61 **Discussion:** This methodological review will provide a complete and comprehensive
62 summary of the frequency of use and types of strategies used for managing the overlap of
63 primary studies across the SRs included in the overviews focusing on exercise-related
64 interventions in different health conditions. Future studies should apply different overlap
65 management strategies to understand their impact on results and conclusions.

66 **Systematic review registration:** INPLASY202250161.

67
68 **Keywords:** Overviews of systematic reviews; Umbrella review; Overlap; Review methods;
69 Exercise; Rehabilitation.

71 **Strengths and limitations**

- 72 - This study aims to describe the strategies used to manage the overlap of primary
73 studies in exercise-related overviews.
- 74 - A sensitive search of MEDLINE (Ovid), Embase (Ovid), The Cochrane Database of
75 Systematic Reviews (Cochrane Library), Epistemonikos databases, and registers of
76 evidence synthesis study protocols will be conducted.
- 77 - Secondly, this study will assess the quality of overview reporting using the recently
78 published Preferred Reporting Items for Overviews of Reviews (PRIOR) statement.
- 79 - In addition, the aim is to analyze whether there is a relationship between the use of
80 any overlap management strategy and the journal's impact factor, year of publication,
81 and compliance with the PRIOR statement.

83 Introduction

84 The number of published primary studies covering a similar research question has grown
85 exponentially (1), limiting the possibility of keeping up to date on a specific topic (2). It is in
86 this context that systematic reviews (SRs) with and without meta-analyses (MAs) of
87 interventions can offer a solution (3), as in addition to synthesizing the available evidence,
88 they use reproducible methods to assess the risk of bias in the primary studies included (4).

89 However, the number of published SRs and MAs has increased steadily in recent years
90 despite the existence of repositories of SRs and MAs protocol registries (5–7) seeking to
91 reduce duplication or redundancy of SR research (8,9).

92 The growth in research evidence makes it difficult for clinicians to stay current and use
93 interventions based on the best available evidence (10,11). Overviews, also known as
94 umbrella reviews, can help clinicians make sense of duplicated SRs on the same topic.
95 Overviews synthesize information and data from multiple similar SRs to guide health
96 decision-making (12).

97 Conducting overviews of health interventions is meant to map the available evidence (13),
98 establishing the effects of different interventions on the same health condition or population
99 (12), examining the effects of an intervention on different health conditions or populations
100 (12), and determining the reasons for disagreement among SRs with or without MAs that
101 answer the same research question (14).

102 Intuitively, one might think that conducting an overview presents the same steps as
103 conducting an SR with MAs; however, overviews pose challenges stemming from the fact
104 that the unit of analysis is the SR (15,16). When conducting an overview, one of the most

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3 105 conflicting methodological issues is the overlap of primary studies included across SRs with
4
5 106 or without MAs (17). When one or more primary studies are included in two or more SRs
6
7 107 with or without MAs, the results and conclusions of the overviews may be biased.
8
9 108 Overlapping data from the same primary studies may include overlapping in risk of bias and
10
11 109 certainty of evidence assessments (e.g., Grading of Recommendations, Assessment,
12
13 110 Development and Evaluations (GRADE)), or overlapping in the determination of the effect
14
15 111 of a specific intervention and other MA outcomes such as heterogeneity (e.g., I^2) (18,19).
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17 112 Overlap in the pooled effect estimates across SRs may lead to overly precise effect estimates
18
19 113 in the overview (20).
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24 114 Methodological studies from different medical fields reported that authors of overviews
25
26 115 rarely assess the overlap of primary studies (16,17). However, these studies have not
27
28 116 conducted an exhaustive search of overviews oriented to a specific health problem, specialty,
29
30 117 or discipline (16,17), as they have only searched an electronic database (16) and included
31
32 118 heterogeneous overviews concerning the research questions addressed (16,17).
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36 119 There are several ways to manage overlap (20). Some will depend heavily on the amount of
37
38 120 overlap and the existing evidence base. Thus, it can be challenging to determine the
39
40 121 methodological approach a priori. Changes to the protocol are likely to occur at this step and
41
42 122 should be clearly reported.
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46 123 SRs that focus on exercise-related interventions are often included in overviews aimed at
47
48 124 grouping and determining the effectiveness of various interventions to manage of specific
49
50 125 health conditions. Assessing the application of overlap management strategies in overviews
51
52 126 focused on exercise-related interventions could contribute to identifying specific or
53
54 127 differentiating aspects. This could be because the concept of exercise is often misunderstood
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3 128 (21). In addition, the existence of multiple interventions related to exercise due to their
4
5 129 different modalities (e.g., continuous aerobic, intervallic aerobic, resistance exercise) and
6
7 130 dosage (e.g., frequency, intensity, time, and type) could result in a particular need to manage
8
9 131 the overlapping of primary studies data.
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13 132 Considering the recently published Preferred Reporting Items for Overviews of Reviews
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15 133 (PRIOR) statement, which incorporates the need to report on the handling of overlapping
16
17 134 primary studies, both in the data collection phase and in the presentation of results, in order
18
19 135 to improve and standardise the reporting of overviews (22), this systematic methodological
20
21 136 review aims to find out how often strategies for handling overlapping data from primary
22
23 137 studies are used in systematic reviews considered by syntheses focusing on exercise-related
24
25 138 interventions in different health conditions. Secondly, it aims to describe the overlap
26
27 139 strategies used, the authors' acknowledgement of not using any overlap management
28
29 140 strategies as a methodological weakness, and the congruence between the protocol and the
30
31 141 final published summary in terms of overlap management. These findings are intended to be
32
33 142 analysed according to the impact factor of the journal in which the overviews were published,
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35 143 the year of publication of the overview, and compliance with the PRIOR statement.
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41 144 **Materials and methods**

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44 145 The protocol of this methodological review is reported following the Preferred Reporting
45
46 146 Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (23) (see checklist
47
48 147 in Supporting Information). In addition, this protocol has been registered in the International
49
50 148 Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) under
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52 149 number INPLASY202250161.
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3 150 ***Eligibility criteria***
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6 151 Studies will be eligible if they meet the following inclusion criteria for study design and
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8 152 population. Given the purpose of this methodological review, the intervention and outcomes
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10 153 will not determine the inclusion of studies, and the comparator or control intervention will
11
12 154 not be considered as it is not applicable.
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16 155 *Study design*
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19 156 We will include overviews that consider SRs with or without MAs, without distinction of the
20
21 157 methodological design of the primary studies included. The definition of SR adopted by the
22
23 158 authors of the overviews (24) will not be considered an eligibility criterion. Overviews that
24
25 159 include primary studies not considered in the selected SRs will not be excluded.
26
27

28
29 160 For this review, an overview will be understood as any study (25) that:
30

- 31 161 1) synthesizes general information, methods, and outcome data from SRs, and
32
33 162 2) makes explicit the inclusion and exclusion criteria for SRs, and
34
35 163 3) includes an explicit search strategy for the studies, and
36
37 164 4) examines the effectiveness of health interventions.
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41 165 Overviews that are conducted using a "rapid review" methodology (26) will be excluded, as
42
43 166 the time frame in which they are conducted to answer urgent questions will likely not
44
45 167 consider the overlap of the primary studies included in the SRs.
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49 168 *Population*
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52 169 Overviews include SRs that have considered primary studies that have studied any exercise-
53
54 170 based intervention, where exercise is understood as a subcategory of physical activity that is
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3 171 planned, structured, repetitive, and purposefully focused on improving or maintaining one or
4
5 172 more components of physical fitness (21), will be included. These overviews may include
6
7
8 173 only SRs related to exercise-based interventions, or other non-exercise interventions as well.
9

10
11 174 Overviews that consider exercise training-based interventions that are applied both
12
13 175 preventively and in the recovery phase, and that are delivered either as a stand-alone
14
15 176 intervention, as part of a comprehensive rehabilitation program, or as an adjunct to other
16
17 177 medical interventions in which exercise is the main component, will be included.
18

19
20 178 Furthermore, the inclusion of overviews will not be limited to the context in which the
21
22 179 exercise-based interventions were applied (e.g., primary care, specialized care) or whether
23
24 180 they were delivered face-to-face, remotely, or mixed.
25
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28 181 Overviews that include SRs that consider physical activity as an intervention, understood as
29
30 182 "any bodily movement produced by skeletal muscles that require energy expenditure"
31
32 183 according to the World Health Organization (27), will be excluded. Therefore, to differentiate
33
34 184 between exercise-based and physical activity-based interventions, it will be considered that
35
36 185 the exercise, together with its structure and dosage (frequency, intensity, time, and type),
37
38 186 must be prescribed or delivered by a professional related to physical training/rehabilitation.
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41 42 43 187 Intervention 44

45 188 Our goal is to identify the strategies used to manage data from overlapping primary studies
46
47 189 selected by SRs included in overviews. Strategies should be specified in the main text of the
48
49 190 overviews and may be in the methods or results section, taking all possible methodological
50
51 191 strategies that address overlap in the primary study data into consideration. Strategies
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53 192 addressing overlap can address different objectives (20), such as quantifying the overlap
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3 193 (17,28) (e.g., corrected covered area (CCA)), visually presenting overlap (29) (e.g., matrix,
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5 194 Venn and Euler diagrams), and avoiding duplicate information by using one or more decision
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7 195 algorithms (30) (e.g., quality of SRs, comprehensive SRs, up-to-datedness of SRs, statistical
8
9 196 methods).

13 197 Outcomes

16 198 The presence and the type of overlap management strategies of the primary studies included
17
18 199 in the SRs will be considered as the main outcome.

21 200 In addition, two aspects will be regarded as secondary outcomes:

- 24 201 1) Acknowledgement of the limitation in the conducting of the overview: we will assess
25
26 202 whether the overview's authors that did not include any strategy for managing
27
28 203 primary study overlap considered this limitation in their discussion or conclusion.
- 31 204 2) Congruence between planning and conducting the overview: we will review available
32
33 205 registry entries (e.g., PROSPERO) or published protocols in scientific journals (e.g.,
34
35 206 BMC Systematic Reviews Journal, BMJ Open) of all overviews included in this SR
36
37 207 to determine whether management of primary study overlap had been considered in
38
39 208 the planning phase of the overviews and to determine the congruence between the
40
41 209 methods proposed in the protocols and those ultimately used.

45 210 **Search strategy**

48 211 A search strategy translated to different databases and their platforms will be developed using
49
50 212 a controlled vocabulary (MeSH and Emtree) and text words. The search strategy will include
51
52 213 a search filter published in 2016 by Lunny et al. (31), which is validated to identify overviews
53
54 214 in MEDLINE-Ovid with 93% sensitivity (95% CI 87 to 96). The search strategy constructed

215 for this database and platform is shown in Table N°1, which will be used as a basis for
 216 adapting the search strategies of the other databases and search platforms.

217 Table 1. Search strategy for MEDLINE using the Ovid platform

N°	Search term
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 meta-analyses 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

218

219 The databases to be consulted will be MEDLINE (Ovid), Embase (Ovid), The Cochrane
 220 Database of Systematic Reviews (Cochrane Library), and Epistemonikos. In addition, we
 221 will search protocol registries of SRs such as the International Platform of Registered
 222 Systematic Review and Meta-analysis Protocols (INPLASY) (<https://inplasy.com/>),
 223 PROSPERO (<https://www.crd.york.ac.uk/PROSPERO/>), and OSF Registries
 224 (<https://osf.io/registries>), and follow up protocols published in scientific journals (e.g., BMC
 225 Systematic Reviews Journal, BMJ Open).

226 We will also review the references of the studies included in this review to identify overviews
227 that may not have been identified by our electronic search strategy.

228 We will include all languages in our search and will not be limited by the date of
229 publication/indexing in databases.

230 **Study selection**

231 Two reviewers (RGA and RTC) will independently and blindly screen the records identified
232 through the search strategy. In the first instance, the titles and abstracts will be evaluated for
233 inclusion. Then the full texts of the records qualified as potentially eligible, and those that
234 did not present sufficient information to be excluded, will be checked for compliance with
235 all eligibility criteria. The Rayyan® application (32) will be used for this stage.
236 Disagreements will be resolved by consensus, or ultimately by a third-party reviewer (RAE
237 or PS).

238 **Data extraction**

239 The extraction of information from the included overviews will also be carried out
240 independently and blindly by two reviewers (RGA and RTC). For this, a standardized
241 extraction form will be used which will contain data related to the basic information of the
242 overviews:

- 243 • Title.
- 244 • Journal name.
- 245 • Year of publication.
- 246 • Name of the authors.
- 247 • Objectives of SRs.

- 1
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3 248 • Number of SRs included
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5 249 • Number of primary studies included
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8 250 • Methodological aspects: databases consulted, date of search, type of synthesis of
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10 251 results (narrative, MA, or both), and instruments for assessing the risk of
11
12 252 bias/methodological quality of the SRs included.

13
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15 253 Data will be extracted to respond to the findings of this methodological review:

- 16
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18 254 • Type of overlap management strategy:
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20 a. Quantifying overlap: e.g., CCA.
21
22 b. Visual presentation of the overlap: e.g., matrix, Venn or Euler diagrams.
23
24 c. Strategies to avoid duplicate information: e.g., Algorithms based on the quality of
25
26 257 SRs, comprehensive SRs, up-to-datedness of SRs, statistical methods such as
27
28 258 sensitivity analyses, or a combination of two or more criteria: e.g., Jadad algorithm
29
30 259 (33).
31
32 260
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35 261 • Step in the conducting of the overview where the strategy has been deployed or used:
36
37 262 e.g., data extraction step, synthesis step.
38
39 263 • Level at which the strategies were applied: i.e., whether it was at the level of SR or
40
41 264 reported outcomes (20).
42
43

44 265 In addition, the impact factor of the journal at the time of publication of the overviews will
45
46 266 be recorded. This will be extracted from the journals' official websites or from Web of
47
48 267 Science (<https://www.webofscience.com/>).

268 If more than one record or publication exists for an overview, the most recent version will be
269 considered for analysis. Disagreements will be resolved by consensus, or ultimately by a
270 third-party reviewer (RAE or PS).

271 **Risk of bias and reporting quality assessment**

272 This methodological review assesses one aspect that may affect the methodological quality
273 or risk of bias of the overviews. The assessment of the overall risk of bias of the overviews
274 is not an objective of this study.

275 Two independent reviewers will assess the quality of the overviews' reporting by considering
276 compliance with the PRIOR statement (22). Disagreements will be resolved by consensus,
277 or ultimately by a third reviewer.

278 **Strategy for data synthesis**

279 The results of the study selection will be schematized through a PRISMA-type flow chart
280 (34). In addition, the characteristics of the overviews included, as well as data related to the
281 primary and secondary outcomes, will be presented in narrative form, and through tables and
282 figures.

283 Descriptive statistics will be used to quantify the number of overviews using overlap
284 strategies, whether the strategies were used at the level of the SRs or the level of each reported
285 outcome. In addition, these results will be organized by the type of strategy used.

286 We will also assess whether the overlapping strategy successfully resolved overlap at the
287 following steps: risk of bias assessment, the certainty of the evidence (e.g., GRADE), and
288 the synthesis step.

289 **Analysis of subgroups**

290 Differences in the percentage of overviews that include overlap management strategies, the
291 type of strategies used, the recognition of the weakness of not using any strategy, and the
292 congruence between the protocols and the methodology finally used among journals with
293 and without IF will be assessed. In addition, this analysis will be repeated for impact factor
294 journals, considering the median or quartiles of the impact factor of the journals at the time
295 of publication of the overviews to form 2 or 4 groups respectively, depending on the number
296 of overviews included in this methodological review. In addition, analysis will be carried out
297 by subgroup according to the year of publication of the overviews and compliance with the
298 items considered in the PRIOR statement.

299 **Discussion**

300 This methodological review will provide a comprehensive and exhaustive summary of the
301 frequency of use of strategies for managing primary study overlap across SRs included in
302 overviews focused on exercise-related interventions in different health conditions. It will also
303 provide insight into the strategies used to quantify and visualize overlap, as well as those
304 used to avoid duplicate data.

305 On the other hand, the findings of this review will tell us whether the authors of the overviews
306 recognized the failure to include some strategy for handling overlap as a methodological
307 weakness, taking into account that the greater the degree of overlap, the more falsely precise
308 the estimates of the effects of the interventions (20). In addition, the congruence between the
309 strategies used by the published overviews and their respective protocols will be revealed.

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3 310 To our knowledge, the latter two aspects have not been addressed at the overview level by
4
5 311 other studies before.

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8 312 Finally, all analyses will be performed by subgroup of overviews, considering the impact
9
10 313 factor of the journal and the year of publication. Although the PRIOR statement was recently
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12 314 published (22), assessing compliance in the reporting of overviews, and its relation to the use
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14 315 of strategies for the management of overlapping primary studies, could expose the
15
16 316 shortcomings and weaknesses that have been committed so far.

17 ***Future research***

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23 318 To continue this line of research, different overlapping data management strategies should
24
25 319 be applied to all, or a representative sample, of the overviews identified by this
26
27 320 methodological review. This could empirically test the benefits and limitations of using any
28
29 321 strategy.

30 31 32 33 322 ***Ethics and dissemination plans***

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36 323 This study will not involve human subjects and therefore does not require ethics committee
37
38 324 approval. However, the conduct and reporting of the findings of this review will be conducted
39
40 325 in a rigorous, systematic, and transparent manner, which relates to research ethics.

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43 326 The findings of this review will be presented at scientific conferences and published as one
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45 327 or more studies in peer-review scientific journals related to rehabilitation, healthcare, or
46
47 328 methodological aspects associated with evidence synthesis.

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52 53 54 330 **Acknowledgments**

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333

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32 428 **Author's contribution**

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34 429 RG-A, DP, CL, and PS contributed to the conception and design of the study. RG-A
35
36 430 developed the search strategies, which was reviewed by RT-C and RA-E. RG-A, DP, CL,
37
38 431 and PS designed the data analysis. RGA-A drafted the manuscript, and all authors read it
39
40 432 critically.
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44 433

Reporting checklist for protocol of a systematic review and meta analysis.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA-Reporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. Syst Rev. 2015;4(1):1.

			Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	1
Update	#1b	If the protocol is for an update of a previous systematic review, identify as such	n/a

1 **Registration**

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4 [#2](#) If registered, provide the name of the registry (such as 4

5 PROSPERO) and registration number

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10 **Authors**

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13 **Contact** [#3a](#) Provide name, institutional affiliation, e-mail address of all 2

14 protocol authors; provide physical mailing address of

15 corresponding author

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20 **Contribution** [#3b](#) Describe contributions of protocol authors and identify the 22

21 guarantor of the review

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26 **Amendments**

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29 [#4](#) If the protocol represents an amendment of a previously n/a

30 completed or published protocol, identify as such and list

31 changes; otherwise, state plan for documenting important

32 protocol amendments

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39 **Support**

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42 **Sources** [#5a](#) Indicate sources of financial or other support for the review 2

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45 **Sponsor** [#5b](#) Provide name for the review funder and / or sponsor 2

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48 **Role of sponsor or** [#5c](#) Describe roles of funder(s), sponsor(s), and / or institution(s), 2

49 funder if any, in developing the protocol

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53 **Introduction**

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56 **Rationale** [#6](#) Describe the rationale for the review in the context of what is 5-7

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1		already known	
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4	Objectives	#7 Provide an explicit statement of the question(s) the review will	7
5		address with reference to participants, interventions,	
6		comparators, and outcomes (PICO)	
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11	Methods		
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14	Eligibility criteria	#8 Specify the study characteristics (such as PICO, study design,	8-10
15		setting, time frame) and report characteristics (such as years	
16		considered, language, publication status) to be used as	
17		criteria for eligibility for the review	
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24	Information	#9 Describe all intended information sources (such as electronic	11
25		databases, contact with study authors, trial registers or other	
26	sources	grey literature sources) with planned dates of coverage	
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32	Search strategy	#10 Present draft of search strategy to be used for at least one	10-13
33		electronic database, including planned limits, such that it	
34		could be repeated	
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39	Study records -	#11a Describe the mechanism(s) that will be used to manage	12-15
40		records and data throughout the review	
41	data management		
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45	Study records -	#11b State the process that will be used for selecting studies (such	12
46		as two independent reviewers) through each phase of the	
47	selection process	review (that is, screening, eligibility and inclusion in meta-	
48		analysis)	
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54	Study records -	#11c Describe planned method of extracting data from reports	12-14
55		(such as piloting forms, done independently, in duplicate), any	
56	data collection		
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1	process		processes for obtaining and confirming data from investigators	
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4	Data items	#12	List and define all variables for which data will be sought	12-13
5			(such as PICO items, funding sources), any pre-planned data	
6			assumptions and simplifications	
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11	Outcomes and	#13	List and define all outcomes for which data will be sought,	10
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13	prioritization		including prioritization of main and additional outcomes, with	
14			rationale	
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19	Risk of bias in	#14	Describe anticipated methods for assessing risk of bias of	14
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21	individual studies		individual studies, including whether this will be done at the	
22			outcome or study level, or both; state how this information will	
23			be used in data synthesis	
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29	Data synthesis	#15a	Describe criteria under which study data will be quantitatively	n/a
30			synthesised	
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34	Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe	14
35			planned summary measures, methods of handling data and	
36			methods of combining data from studies, including any	
37			planned exploration of consistency (such as I ² , Kendall's τ)	
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44	Data synthesis	#15c	Describe any proposed additional analyses (such as	15
45			sensitivity or subgroup analyses, meta-regression)	
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49	Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type	14
50			of summary planned	
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55	Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as	n/a
56			publication bias across studies, selective reporting within	
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studies)

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4 Confidence in [#17](#) Describe how the strength of the body of evidence will be n/a
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6 cumulative assessed (such as GRADE)
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8 evidence
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11 The PRISMA-P elaboration and explanation paper is distributed under the terms of the Creative
12 Commons Attribution License CC-BY. This checklist was completed on 06. November 2022 using
13 <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with
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16 [Penelope.ai](#)
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BMJ Open

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

Journal:	<i>BMJ Open</i>
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Primary Subject Heading:	Research methods
Secondary Subject Heading:	Sports and exercise medicine, Rehabilitation medicine, Medical publishing and peer review
Keywords:	REHABILITATION MEDICINE, STATISTICS & RESEARCH METHODS, SPORTS MEDICINE

SCHOLARONE™
Manuscripts

1 **Strategies used to manage overlap of primary study data by exercise-related overviews.**

2 **Protocol for a systematic methodological review.**

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31 **Abstract**

32 **Introduction:** One of the most conflicting methodological issues when conducting an
33 overview is the overlap of primary studies across systematic reviews (SRs). Overlap in the
34 pooled effect estimates across SRs may lead to overly precise effect estimates in the
35 overview. SRs that focus on exercise-related interventions are often included in overviews
36 aimed at grouping and determining the effectiveness of various interventions for managing
37 specific health conditions. The aim of this systematic methodological review is to describe
38 the strategies used by authors of overviews focusing on exercise-related interventions to
39 manage the overlap of primary studies.

40 **Methods and analysis:** A comprehensive search strategy has been developed for different
41 databases and their platforms. The databases to be consulted will be MEDLINE (Ovid),
42 Embase (Ovid), The Cochrane Database of Systematic Reviews (Cochrane Library), and
43 Epistemonikos. Two reviewers will independently screen the records identified through the
44 search strategy and extract the information from the included overviews. The frequency and
45 the type of overlap management strategies of the primary studies included in the SRs will be
46 considered as the main outcome. In addition, the recognition of the lack of use of any overlap
47 management strategy and the congruence between planning and conducting the overview
48 focusing on overlap management strategies will be assessed. A subgroup analysis will be
49 carried out according to the journal impact factor, year of publication, and compliance with
50 the PRIOR statement.

51 **Ethics and dissemination**

1
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3 52 This study will not involve human subjects and therefore does not require ethics committee
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5 53 approval. However, the conduct and reporting of the findings of this review will be conducted
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7 54 in a rigorous, systematic, and transparent manner, which relates to research ethics.
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10 55 The findings of this review will be presented at scientific conferences and published as one
11
12 56 or more studies in peer-review scientific journals related to rehabilitation or research
13
14 57 methods.
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18 58 **Keywords:** Overviews of systematic reviews; Umbrella review; Overlap; Review methods;
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20 59 Exercise; Rehabilitation.
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23 60 24 25 26 61 **Strengths and limitations**

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29 62 - This methodological review will use a systematic approach to describe the strategies
30
31 63 used to manage the overlap of primary studies in exercise-related overviews.
32
33 64 - This review will conduct a sensitive search of MEDLINE (Ovid), Embase (Ovid),
34
35 65 The Cochrane Database of Systematic Reviews (Cochrane Library), Epistemonikos
36
37 66 databases and registers of evidence synthesis study protocols to identify exercise-
38
39 67 related overviews.
40
41 68 - This review will be one of the first to assess the quality of synthesis reports using the
42
43 69 recently published Preferred Reporting Items for Overviews of Reviews (PRIOR)
44
45 70 statement.
46
47 71 - A potential limitation of this review is that the overviews identified do not report in
48
49 72 detail the methodology used to deal with the overlap.
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74 **Introduction**

75 The number of published primary studies covering a similar research question has grown
76 exponentially (1), limiting the possibility of keeping current on a specific topic (2). It is in
77 this context that systematic reviews (SRs) with and without meta-analyses (MAs) of
78 interventions can offer a solution (3), as in addition to synthesizing the available evidence,
79 they use reproducible methods to assess the risk of bias in the primary studies included (4).

80 However, the number of published SRs and MAs has increased steadily in recent years
81 despite repositories of SRs and MAs protocol registries (5–7) seeking to reduce duplication
82 or redundancy of SR research (8,9).

83 The growth in research evidence makes it difficult for clinicians to stay current and use
84 interventions based on the best available evidence (10,11). Overviews, also known as
85 umbrella reviews, can help clinicians make sense of duplicated SRs on the same topic.
86 Overviews synthesize information and data from similar SRs to guide health decision-
87 making (12).

88 When conducting an overview, one of the most conflicting methodological issues is the
89 overlap of primary studies across SRs with or without MAs (13). When one or more primary
90 studies are included in two or more SRs with or without MAs, the results and conclusions of
91 the overviews may be biased. Overlapping data from the same primary studies may include
92 overlapping in risk of bias and certainty of evidence assessments (e.g., Grading of
93 Recommendations, Assessment, Development and Evaluations (GRADE)) or overlapping in
94 the determination of the effect of a specific intervention and other MA outcomes such as

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2
3 95 heterogeneity (e.g., I^2) (14,15). Overlapping pooled effect estimates across SRs may lead to
4
5 96 overly precise effect estimates in the overview (16).
6
7

8 97 Methodological studies from different medical fields reported that authors of overviews
9
10 98 rarely assess the overlap of primary studies (13,17). However, these studies have not
11
12 99 conducted an exhaustive search of overviews oriented to a specific health problem, specialty,
13
14 100 or discipline (13,17), as they have only searched an electronic database (17) and included
15
16 101 heterogeneous overviews concerning the research questions addressed (13,17).
17
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20 102 SRs that focus on exercise-related interventions are often included in overviews aimed at
21
22 103 grouping and determining the effectiveness of various interventions to manage of specific
23
24 104 health conditions. Assessing the application of overlap management strategies in overviews
25
26 105 focused on exercise-related interventions could contribute to identifying specific or
27
28 106 differentiating aspects. This could be because the concept of exercise needs to be understood
29
30 107 (18). In addition, the existence of multiple interventions related to exercise due to their
31
32 108 different modalities (e.g., continuous aerobic, intervallic aerobic, resistance exercise) and
33
34 109 dosage (e.g., frequency, intensity, time, and type) could result in a particular need to manage
35
36 110 the overlapping of primary studies data.
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40 111 Considering the recently published Preferred Reporting Items for Overviews of Reviews
41
42 112 (PRIOR) statement, which incorporates the need to report on the handling of overlapping
43
44 113 primary studies, both in the data collection phase and in the presentation of results, to improve
45
46 114 and standardize the reporting of overviews (19), this systematic methodological review aims
47
48 115 to find out how often strategies for handling overlapping data from primary studies are used
49
50 116 in systematic reviews considered by syntheses focusing on exercise-related interventions in
51
52 117 different health conditions. Secondly, it aims to describe the overlap strategies used, the
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3 118 authors' acknowledgment of not using any overlap management strategies as a
4
5 119 methodological weakness, and the congruence between the protocol and the final published
6
7 120 summary in terms of overlap management. These findings are intended to be analyzed
8
9 121 according to the impact factor of the journal in which the overviews were published, the year
10
11 122 of publication of the overview, and compliance with the PRIOR statement.
12
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14 15 123 **Materials and methods**

16
17
18 124 The protocol of this methodological review is reported following the Preferred Reporting
19
20 125 Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (20) (see checklist
21
22 126 in Supporting Information). The start of this study with the preliminary design of the search
23
24 127 strategies began in June 2022, and this methodological review is expected to be finalized in
25
26 128 April 2023.
27
28

29 30 129 *Eligibility criteria*

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32
33 130 Studies will be eligible if they meet the following inclusion criteria for study design and
34
35 131 population. Given the purpose of this methodological review, the intervention and outcomes
36
37 132 will not determine the inclusion of studies, and the comparator or control intervention will
38
39 133 not be considered as it is not applicable.
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42 43 134 *Study design*

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46 135 We will include overviews that consider SRs with or without MAs, without distinction of the
47
48 136 methodological design of the primary studies included. The definition of SR adopted by the
49
50 137 authors of the overviews (21) will not be considered an eligibility criterion. Overviews that
51
52 138 include primary studies not considered in the selected SRs will not be excluded.
53
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56 139 For this review, an overview will be understood as any study (22) that:
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- 140 1) synthesizes general information, methods, and outcome data from SRs, and
- 141 2) makes explicit the inclusion and exclusion criteria for SRs, and
- 142 3) includes an explicit search strategy for the studies, and
- 143 4) examines the effectiveness of health interventions.

144 Overviews that are conducted using a "rapid review" methodology (23) will be excluded, as
145 the time frame in which they are conducted to answer urgent questions will likely not
146 consider the overlap of the primary studies included in the SRs. In addition, overviews
147 published only as abstracts in conference proceedings will be excluded.

148 Population

149 Overviews include SRs that have considered primary studies that have studied any exercise-
150 based intervention, where exercise is understood as a subcategory of physical activity that is
151 planned, structured, repetitive, and purposefully focused on improving or maintaining one or
152 more components of physical fitness (18), will be included. These overviews may include
153 only SRs related to exercise-based interventions, or other non-exercise interventions as well.

154 Overviews that consider exercise training-based interventions that are applied both
155 preventively and in the recovery phase, and that are delivered either as a stand-alone
156 intervention, as part of a comprehensive rehabilitation program, or as an adjunct to other
157 medical interventions in which exercise is the main component, will be included.

158 Furthermore, the inclusion of overviews will not be limited to the context in which the
159 exercise-based interventions were applied (e.g., primary care, specialized care) or whether
160 they were delivered face-to-face, remotely, or mixed.

1
2
3 161 Overviews that include SRs that consider physical activity as an intervention, understood as
4
5 162 "any bodily movement produced by skeletal muscles that require energy expenditure"
6
7
8 163 according to the World Health Organization (24), will be excluded. Therefore, to differentiate
9
10 164 between exercise-based and physical activity-based interventions, it will be considered that
11
12 165 the exercise, together with its structure and dosage (frequency, intensity, time, and type),
13
14 166 must be prescribed or delivered by a professional related to physical training/rehabilitation.

17 Intervention

18
19
20 168 Our goal is to identify the strategies used to manage data from overlapping primary studies
21
22 169 selected by SRs included in overviews. Strategies should be specified in the main text of the
23
24
25 170 overviews and may be in the methods or results section, taking all possible methodological
26
27 171 strategies that address overlap in the primary study data into consideration. Strategies
28
29
30 172 addressing overlap can address different objectives (16), such as quantifying the overlap
31
32 173 (13,25) (e.g., corrected covered area (CCA)), visually presenting overlap (26) (e.g., matrix,
33
34 174 Venn and Euler diagrams), and avoiding duplicate information by using one or more decision
35
36 175 algorithms (27) (e.g., quality of SRs, comprehensive SRs, up-to-datedness of SRs, statistical
37
38
39 176 methods).

41 Outcomes

42
43
44
45 178 The presence and the type of overlap management strategies of the primary studies included
46
47 179 in the SRs will be considered as the main outcome.

48
49
50 180 In addition, two aspects will be regarded as secondary outcomes:
51
52
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59
60

- 1
2
3 181 1) Acknowledgement of the limitation in the conducting of the overview: we will assess
4
5 182 whether the overview's authors that did not include any strategy for managing
6
7 183 primary study overlap considered this limitation in their discussion or conclusion.
8
9
10 184 2) Congruence between planning and conducting the overview: we will review available
11
12 185 registry entries (e.g., PROSPERO) or published protocols in scientific journals (e.g.,
13
14 186 BMC Systematic Reviews Journal, BMJ Open) of all overviews included in this SR
15
16
17 187 to determine whether management of primary study overlap had been considered in
18
19 188 the planning phase of the overviews and to determine the congruence between the
20
21 189 methods proposed in the protocols and those ultimately used.
22
23

24 190 **Search strategy**

25
26
27 191 A search strategy translated to different databases and their platforms will be developed using
28
29 192 a controlled vocabulary (MeSH and Emtree) and text words. The search strategy will include
30
31 193 a search filter published in 2016 by Lunny et al. (28), which is validated to identify overviews
32
33 194 in MEDLINE-Ovid with 93% sensitivity (95% CI 87 to 96). The search strategy constructed
34
35 195 for this database and platform is shown in Table N°1, which will be used as a basis for
36
37 196 adapting the search strategies of the other databases and search platforms.
38
39
40
41

42 197 Table 1. Search strategy for MEDLINE using the Ovid platform

N°	Search term
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 meta-analyses 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

198

199 The databases to be consulted will be MEDLINE (Ovid), Embase (Ovid), The Cochrane
 200 Database of Systematic Reviews (Cochrane Library), and Epistemonikos. In addition, we
 201 will search protocol registries of SRs such as the International Platform of Registered
 202 Systematic Review and Meta-analysis Protocols (INPLASY) (<https://inplasy.com/>),
 203 PROSPERO (<https://www.crd.york.ac.uk/PROSPERO/>), and OSF Registries
 204 (<https://osf.io/registries>), and follow up protocols published in scientific journals (e.g., BMC
 205 Systematic Reviews Journal, BMJ Open). All search resources will be reviewed from
 206 inception until June 2022.

207 We will also review the references of the studies included in this review to identify overviews
 208 that may not have been identified by our electronic search strategy.

209 We will include all languages in our search and will not be limited by the date of
 210 publication/indexing in databases.

211 **Study selection**

212 Two reviewers (RGA and RTC) will independently and blindly screen the records identified
 213 through the search strategy. In the first instance, the titles and abstracts will be evaluated for

1
2
3 214 inclusion. Then the full texts of the records qualified as potentially eligible, and those that
4
5 215 did not present sufficient information to be excluded, will be checked for compliance with
6
7 216 all eligibility criteria. A pilot test will be conducted with 50 studies to adjust the clarity of the
8
9 217 eligibility criteria.

11
12
13 218 The Rayyan® application (29) will be used for this stage. Disagreements will be resolved by
14
15 219 consensus, or ultimately by a third-party reviewer (RAE or PS).

18 220 **Data extraction**

21 221 The extraction of information from the included overviews will also be carried out
22
23 222 independently and blindly by two reviewers (RGA and RTC). For this, a standardized
24
25 223 extraction form will be used which will contain data related to the basic information of the
26
27 224 overviews:

- 31 225 • Title.
- 33 226 • Journal name.
- 35 227 • Year of publication.
- 38 228 • Name of the authors.
- 40 229 • Objectives of SRs.
- 43 230 • Number of SRs included
- 45 231 • Number of primary studies included
- 48 232 • Methodological aspects: databases consulted, date of search, type of synthesis of
49 233 results (narrative, MA, or both), and instruments for assessing the risk of
51 234 bias/methodological quality of the SRs included.

55 235 Data will be extracted to respond to the findings of this methodological review:

- 1
2
3 236 • Type of overlap management strategy:
4
5 237 a. Quantifying overlap: e.g., CCA.
6
7 238 b. Visual presentation of the overlap: e.g., matrix, Venn or Euler diagrams.
9
10 239 c. Strategies to avoid duplicate information: e.g., Algorithms based on the quality of
11
12 240 SRs, comprehensive SRs, up-to-datedness of SRs, statistical methods such as
13
14 241 sensitivity analyses, or a combination of two or more criteria: e.g., Jadad algorithm
15
16 242 (30).
17
18
19 243 • Step in the conducting of the overview where the strategy has been deployed or used:
20
21 244 e.g., data extraction step, synthesis step.
22
23
24 245 • Level at which the strategies were applied: i.e., whether it was at the level of SR or
25
26 246 reported outcomes (16).
27

28
29 247 In addition, the impact factor of the journal at the time of publication of the overviews will
30
31 248 be recorded. This will be extracted from the journals' official websites or from Web of
32
33 249 Science (<https://www.webofscience.com/>).

34
35
36
37 250 If more than one record or publication exists for an overview, the most recent version will be
38
39 251 considered for analysis. The data extraction form will be tested with 10 studies to assess its
40
41 252 completeness, and adjusted if necessary. Disagreements will be resolved by consensus, or
42
43 253 ultimately by a third-party reviewer (RAE or PS).
44
45

46 254 **Risk of bias and reporting quality assessment**

47
48
49 255 This methodological review assesses one aspect that may affect the methodological quality
50
51 256 or risk of bias of the overviews. The assessment of the overall risk of bias of the overviews
52
53 257 is not an objective of this study.
54
55
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60

258 Two independent reviewers will assess the quality of the overviews' reporting by considering
259 compliance with the PRIOR statement (19). Disagreements will be resolved by consensus,
260 or ultimately by a third reviewer.

261 **Strategy for data synthesis**

262 The results of the study selection will be schematized through a PRISMA-type flow chart
263 (31). In addition, the characteristics of the overviews included, as well as data related to the
264 primary and secondary outcomes, will be presented in narrative form, and through tables and
265 figures.

266 Descriptive statistics will be used to quantify the number of overviews using overlap
267 strategies, whether the strategies were used at the level of the SRs or the level of each reported
268 outcome. In addition, these results will be organized by the type of strategy used.

269 We will also assess whether the overlapping strategy successfully resolved overlap at the
270 following steps: risk of bias assessment, the certainty of the evidence (e.g., GRADE), and
271 the synthesis step. Resolution of the overlap will be considered to have been achieved when
272 the authors manage to avoid double/multiple counting of information from the primary
273 studies.

274 **Analysis of subgroups**

275 Differences in the percentage of overviews that include overlap management strategies, the
276 type of strategies used, the recognition of the weakness of not using any strategy, and the
277 congruence between the protocols and the methodology finally used among journals with
278 and without IF will be assessed. In addition, this analysis will be repeated for impact factor
279 journals, considering the median or quartiles of the impact factor of the journals at the time

280 of publication of the overviews to form 2 or 4 groups respectively, depending on the number
281 of overviews included in this methodological review.

282 In addition, analysis will be carried out by subgroup according to the year of publication of
283 the overviews, compliance with the items considered in the PRIOR statement, and whether
284 or not the overviews were published in the Cochrane Database of Systematic Reviews.

285 **Patient and Public Involvement**

286 Because this protocol is about conducting a methodological review, both patients and the
287 public were not involved. This methodological review is intended to be of use to researchers
288 of evidence synthesis studies.

289 **Discussion**

290 This methodological review will provide a comprehensive and exhaustive summary of the
291 frequency of use of strategies for managing primary study overlap across SRs included in
292 overviews focused on exercise-related interventions in different health conditions. It will also
293 provide insight into the strategies used to quantify and visualize overlap, as well as those
294 used to avoid duplicate data.

295 On the other hand, the findings of this review will tell us whether the authors of the overviews
296 recognized the failure to include some strategy for handling overlap as a methodological
297 weakness, taking into account that the greater the degree of overlap, the more falsely precise
298 the estimates of the effects of the interventions (16). In addition, the congruence between the
299 strategies used by the published overviews and their respective protocols will be revealed.
300 To our knowledge, the latter two aspects have not been addressed at the overview level by
301 other studies before.

302 Finally, all analyses will be performed by subgroup of overviews, considering the impact
303 factor of the journal and the year of publication. Although the PRIOR statement was recently
304 published (19), assessing compliance in the reporting of overviews, and its relation to the use
305 of strategies for the management of overlapping primary studies, could expose the
306 shortcomings and weaknesses that have been committed so far.

307 *Future research*

308 To continue this line of research, different overlapping data management strategies should
309 be applied to all, or a representative sample, of the overviews identified by this
310 methodological review. This could empirically test the benefits and limitations of using any
311 strategy.

312 *Ethics and dissemination*

313 This study will not involve human subjects and therefore does not require ethics committee
314 approval. However, the conduct and reporting of the findings of this review will be conducted
315 in a rigorous, systematic, and transparent manner, which relates to research ethics.

316 The findings of this review will be presented at scientific conferences and published as one
317 or more studies in peer-review scientific journals related to rehabilitation, healthcare, or
318 methodological aspects associated with evidence synthesis.

319

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2
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4
5

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7
8 325 or not-for-profit sectors.
9

10
11 326

12
13
14 **327 Competing interests**
15

16
17 328 All authors declare no competing interests.
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20 329

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23 **330 Data sharing**
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25
26 331 Not applicable
27
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29 332

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31
32 **333 Author's contribution**
33

34
35 334 RG-A, DP, CL, and PS contributed to the conception and design of the study. RG-A
36
37 335 developed the search strategies, which was reviewed by RT-C and RA-E. RG-A, DP, CL,
38
39 336 and PS designed the data analysis. RGA-A drafted the manuscript, and all authors read it
40
41 337 critically.
42
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Reporting checklist for protocol of a systematic review and meta analysis.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA-Reporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. Syst Rev. 2015;4(1):1.

			Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	1
Update	#1b	If the protocol is for an update of a previous systematic review, identify as such	n/a

1 Registration

2
3
4 [#2](#) If registered, provide the name of the registry (such as 4
5
6 PROSPERO) and registration number
7
8

9 Authors

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11
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13 Contact [#3a](#) Provide name, institutional affiliation, e-mail address of all 2
14
15 protocol authors; provide physical mailing address of
16
17 corresponding author
18

19
20 Contribution [#3b](#) Describe contributions of protocol authors and identify the 22
21
22 guarantor of the review
23
24

25 Amendments

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27
28
29 [#4](#) If the protocol represents an amendment of a previously n/a
30
31 completed or published protocol, identify as such and list
32
33 changes; otherwise, state plan for documenting important
34
35 protocol amendments
36
37

38 Support

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42 Sources [#5a](#) Indicate sources of financial or other support for the review 2
43

44
45 Sponsor [#5b](#) Provide name for the review funder and / or sponsor 2
46

47
48 Role of sponsor or [#5c](#) Describe roles of funder(s), sponsor(s), and / or institution(s), 2
49
50 funder
51 if any, in developing the protocol
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53 Introduction

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55
56 Rationale [#6](#) Describe the rationale for the review in the context of what is 5-7
57
58

1		already known	
2			
3			
4	Objectives	#7 Provide an explicit statement of the question(s) the review will	7
5		address with reference to participants, interventions,	
6		comparators, and outcomes (PICO)	
7			
8			
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10			
11	Methods		
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14	Eligibility criteria	#8 Specify the study characteristics (such as PICO, study design,	8-10
15		setting, time frame) and report characteristics (such as years	
16		considered, language, publication status) to be used as	
17		criteria for eligibility for the review	
18			
19			
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23			
24	Information	#9 Describe all intended information sources (such as electronic	11
25		databases, contact with study authors, trial registers or other	
26	sources	grey literature sources) with planned dates of coverage	
27			
28			
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32	Search strategy	#10 Present draft of search strategy to be used for at least one	10-13
33		electronic database, including planned limits, such that it	
34		could be repeated	
35			
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38			
39	Study records -	#11a Describe the mechanism(s) that will be used to manage	12-15
40		records and data throughout the review	
41	data management		
42			
43			
44			
45	Study records -	#11b State the process that will be used for selecting studies (such	12
46		as two independent reviewers) through each phase of the	
47	selection process	review (that is, screening, eligibility and inclusion in meta-	
48		analysis)	
49			
50			
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54	Study records -	#11c Describe planned method of extracting data from reports	12-14
55		(such as piloting forms, done independently, in duplicate), any	
56	data collection		
57			
58			
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60			

1	process		processes for obtaining and confirming data from investigators	
2				
3				
4	Data items	#12	List and define all variables for which data will be sought	12-13
5			(such as PICO items, funding sources), any pre-planned data	
6			assumptions and simplifications	
7				
8				
9				
10				
11	Outcomes and	#13	List and define all outcomes for which data will be sought,	10
12				
13	prioritization		including prioritization of main and additional outcomes, with	
14			rationale	
15				
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17				
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19	Risk of bias in	#14	Describe anticipated methods for assessing risk of bias of	14
20				
21	individual studies		individual studies, including whether this will be done at the	
22			outcome or study level, or both; state how this information will	
23			be used in data synthesis	
24				
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28				
29	Data synthesis	#15a	Describe criteria under which study data will be quantitatively	n/a
30			synthesised	
31				
32				
33				
34	Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe	14
35			planned summary measures, methods of handling data and	
36			methods of combining data from studies, including any	
37			planned exploration of consistency (such as I ² , Kendall's τ)	
38				
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44	Data synthesis	#15c	Describe any proposed additional analyses (such as	15
45			sensitivity or subgroup analyses, meta-regression)	
46				
47				
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49	Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type	14
50			of summary planned	
51				
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54				
55	Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as	n/a
56			publication bias across studies, selective reporting within	
57				
58				
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studies)

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3
4 Confidence in [#17](#) Describe how the strength of the body of evidence will be n/a
5
6 cumulative assessed (such as GRADE)
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8 evidence
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10
11 The PRISMA-P elaboration and explanation paper is distributed under the terms of the Creative
12 Commons Attribution License CC-BY. This checklist was completed on 06. November 2022 using
13 <https://www.goodreports.org/>, a tool made by the [EQUATOR Network](#) in collaboration with
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