Peer Review File

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Reviewer A

Comment 1: The objective could be clarified - Line 24: Objective: To analyze the purpose and utility of prehabilitation and preoperative exercise in the context of metabolic and bariatric surgery - Are you analyzing prehabilitation and preoperative exercise individually or is it actually prehabilitation which includes preoperative exercise (as defined, line 28)?

Reply 1: The objective refers to prehabilitation which includes preoperative exercise. This has been edited and clarified within the "Background and Objective" section of the abstract.

Comment 2: Within the discussion and conclusion there is repeated mention of the need for a formal (line 99) or standardised (line 233) definition of prehabilitation in order to strengthen and validate research. However, Prehabilitation has been well defined within the review (line 28 & 58-60) and is only ever likely to become more specific or defined in its content when applied to patient groups with more specific needs. For example, as mentioned within the review - frailty (identifying & targeting the individual persons causes of frailty), limiting Cardiac conditions (informing and demonstrating what is suitable & safe whilst awaiting cardiac surgery), orthopaedic patients (centred around the specific area of surgery), cancer patients (holistic nature of physically optimisation pre-chemo).

Reply 2: Although we provided a consistent and specific definition of prehabilitation in our review, this is not reflected in the current body of literature. Our definition was based on what the majority of studies present as prehabilitation, but outliers with discordant definitions are still present. We still believe that a unified definition of prehabilition, whether it is the same as what we presented or another description provided by a professional organization, is important to provide clarity across future publications and improve knowledge translation. The first paragraph of the discussion section has been edited to address this.

Comment 3: The review centres around bariatric surgery as a whole but as not all patients require rehabilitation, not all will require prehabilitation. Prehabilitation and bariatric surgery are both broad and non-specific so will unlikely have a 'one size fits all' standardised approach. So maybe it's not the definition that needs to be standardised, but rather an identification of the patients who would likely benefit and standardising a menu of appropriate pre-op interventions (prehabilitation). This is somewhat discussed within the limitations and conclusion but is confused by the mention of a need for standardised definition.

Reply 3: Thank you for bringing up this point- we agree that identifying which patients would most benefit from prehabilitation is highly important. However, we still believe that a standardized definition for the sake of homogeneity across literature is still beneficial. Identifying the patients who would benefit most and providing a consistent definition are not mutually exclusive, and we believe clarification with both through future investigations would be highly valuable. The first paragraph of the conclusion has been edited to better reflect these views.

Reviewer B

Comment 1: The objective stated is to “analyze the purpose and ultility of prehabilitation.” The body of the review, including conclusions, does not relate back to this objective in a structured way. There needs to be less focus on the efficacy of the prehab and more about how, where, when and why it is used within the literature/research. I don’t believe this has been well structured or covered well enough to answer those objectives.

Reply 1: We agree that the original objective did not accurately reflect our intended purpose with this study. Rather than providing a critical analysis of prehabilitation, which may be premature given the status of available literature, we aim to summarize the available information and describe the implications and clinical practicality of prehabilitation. However, we still believe that the efficacy of prehabilitation should be well understood and included within our review. The published results and objective data that comprise efficacy are necessary to provide a basis of information from which one may eventually extrapolate the how, when, where, and why of an intervention. The changes with our objectives have been implemented within the abstract, introduction, and conclusion.

Comment 2: The authors do state that the definition relates to exercise, and that they will be focusing on exercise interventions, but then do include interventions with a dietary/ multimodal component in their selected articles. I believe if you are to include diet AND exercise interventions, then the key search terms need to be expanded to include weight loss interventions. In clinical practice and in the literature, not all of these interventions are named 'prehabilitation', and could be named 'lifestyle', 'diet' 'weight loss', etc. I think using the term 'prehabilitation' completely separate from weight loss interventions as you have mentioned, will not best represent what is being done in clinical practice. Just because an intervention is not specifically named 'prehabilitation' does not make it any different from prehab if it aims to achieve the same thing, through preop exercise, weight loss using exercise, etc. I think there needs to be some clearer boundaries or better explanation as to why not all of these can be considered 'prehab'.

Reply 2: Thank you for bringing up this important point- we agree that it can be challenging to identify what exactly comprises prehabilitation. In our opinion and for the purposes of the review, prehabilitation, similar to rehabilitation, encompasses interventions that have the goal of improving functional capacity, as represented by activity tolerance, mobility, and/or strength. Exercise is consequently a crucial component to prehabilitation and was required for inclusion in our review. We allowed dietary counseling, among other multimodal interventions, to still be included because it is rare to find a clinical study on preoperative bariatric patients that does not provide these additional resources. However, we necessitated that prehabilitation in the form of exercise or activity was present because we did not think the goal of improving functional capacity could be reached without it. On the other hand, weight loss interventions differ in that the goal is simply to lower the number of kilograms or pounds displayed on a scale. One can achieve improvements in functional capacity without demonstrating weight loss, and one can lose weight without increases in functional capacity. Interventions that were only dietary or counseling in nature, or those that simply encouraged exercise without providing a way to follow up or track progress, were not included because they were not considered to be effective methods of improving functional capacity. Information clarifying all of the above have been added to the first paragraph of the introduction.

Comment 3: Much of the discussion of the review is about surgical, weight loss, physiological, and patient-reported outcomes resulting from prehab. This does not appear to align with the aim of the review- examining the Purpose and Utility of prehabilitation described in the literature. To my mind, the review should focus on the where, when, how and why of the prehab. Not the outcomes.

Reply 3: Thank you for highlighting this discrepancy. We have edited our objectives to better reflect our intended goals with this study: summarize the available information and describe the implications and clinical practicality of prehabilitation. We believe that it is important to understand outcomes prior to determining the where, when, how, and why of prehabilitation, especially when most data surrounding the subject is relatively new and variable. By modifying our objectives, the discussion should now better align with our intended purpose of the study. These changes in the objectives have been made within the abstract, introduction, and conclusion.

Comment 4: The limitations section needs to also talk about the limitations of the review itself, not just the articles found. More needs to be divulged about what the authors believe the limitations of this review were and how this may have impacted the outcomes/ biased the review.

Reply 4: We agree with this comment and have added to the limitations section of the discussion. The most prominent limitation of the review itself is the overrepresentation of North American institutions, with nearly three quarters of the included studies published in the United States or Canada. This consequently introduces bias as practices within other countries, in comparison, are not well captured.

Comment 5: More detail is required for how the search was conducted, and the articles were selected. You have used terms: “prehabilitation”, “preoperative exercise”, “bariatric surgery”, “metabolic surgery”, “gastric bypass”, and “sleeve gastrectomy.” There are many types of bariatric procedures other than gastric bypass and sleeves which may have been missed in the literature – suggest adding all common procedure names (e.g. Roux-en-Y, etc) to the search. Additional detail is required on how the terms were searched, with an example of a search per Author instructions. How exactly was consensus reached? Not enough detail. As per Author instructions - “whether it was conducted independently, how consensus was obtained, etc.)”

Reply 5: Thank you for your suggestion. By including the overarching terms “bariatric surgery” and “metabolic surgery,” we had hoped to capture the other surgeries within that category. Nevertheless, we agree with your recommendation to broaden the terms and reran the search after adding “Roux-en-Y gastric bypass”, “one anastomosis gastric bypass”, “biliopancreatic diversion with duodenal switch”, and “single anastomosis duodenal-ileal bypass with sleeve gastrectomy” and yielded the same results. The methods section and Table 1 were updated with this information. The additional details that were requested have also been added to the methods section and Table 1. The example search per author instructions has been added as a supplementary figure.

Comment 6: Stick to conclusions drawn from your own work not others. The conclusions drawn do not align with the aim of the review. The conclusions should relate to the objectives (analyze the purpose and utility of prehabilitation). The reader should be able to read the abstract and have those questions answered in the conclusion.

Reply 6: We have revised our objectives to that the conclusion better aligns with them. As mentioned above, rather than striving for a critical analysis, our new aims are to summarize available information and describe their implications. We hope by doing this, these questions are better answered in the conclusion.

Comment 7: Knowing that prehabilitation is a modern term unlikely to have been used in articles 1990-2010, other terms should be included to capture older articles, OR the time-frame criteria for articles should be changed to the last 10 years. Suggest including terms not specifically named ‘prehabilitation’ but exercise/physical activity and health interventions including exercise in the preop period.

Reply 7: We agree that prehabilitation has been a recently introduced term. The reason we searched all articles was to capture studies utilizing an intervention that would qualify as prehabilitation today but not labeled as such because the term did not exist at that time. “Preoperative exercise” was included within our search terms to capture this subset of articles. This additional information has been added in the methods section.

Comment 8: (Line 235-236] A conclusion has been drawn about delaying surgery for no benefit here, but these two references are relating to surgery in the US under insurance. In other countries with significantly different

healthcare systems, this may not apply. I suggest authors cannot make this broad conclusion without mentioning the context. Also, this conclusion appears to be new information not resulting from the articles in the review. The conclusion needs to summarise the answer to the objectives as previously mentioned and not make any new claims or statements not previously mentioned or examined as part of the review.

Reply 8: Thank you for pointing this out. The section discussing insurance clearance has been reframed within the context of medicine in the United States, and information regarding practices in Canada and the United Kingdom has also been added. We agree with your statement regarding new information in the conclusion. To correct this, we have addressed prehabilitation as a potential barrier to care in the discussion.

Comment 9: Perhaps it is worth thinking about focusing the review not on 'prehabilitation' as a term, but preoperative exercise. I think using prehab as your topic but then including exercise PLUS other interventions may muddy the waters of your review, and it may be more beneficial to single out exercise only to really drill down on what is being used, when, where and why. This would perhaps give the review better clarity and structure that it needs, as at the moment I think it is trying to differentiate prehabilitation from all other preop health interventions which is confusing to the reader.

Reply 9: We agree that it can be difficult to differentiate between prehabilitation and all other preoperative interventions, and we could have presented the information more clearly. What distinguishes prehabilitation is the goal of improving functional capacity, which may not be shared by other interventions. Some preoperative exercise is utilized in the context of only achieving weight loss, as demonstrated by passive monitoring and lack of structure or guidance. The introduction has been edited to better present these points. While evaluating only an exercise intervention would generate a cleaner study, it is challenging to do so in a clinical context since most, if not all, patients awaiting bariatric surgery are offered additional resources. Additionally, all but one of the studies included in this review utilized a control group that received "standard care" or the usual counseling and dietary education. Because the intervention was limited to exercise in these cases, this provides greater support that the results are due to that change.

Reviewer C

Comment 1: The reference list is not up to date - none of the systematic reviews and meta-analyses recently published in this area were cited. For example, there was a review published Jan 2022: The Effect of Pre-operative Exercise Intervention on Patient Outcomes Following Bariatric Surgery: a Systematic Review and Meta-analysis. Your work would complement this review but must acknowledge and incorporate the work of these authors.

Reply 1: Thank you for bringing this to our attention. Two recent systematic review and meta-analyses, including Durey et al. that was cited, have been added to the discussion section.

Comment 2: Please include the details (or reference) of the 'narrative review reporting checklist' you have chosen to use.

Reply 2: A reference to the narrative review reporting checklist has been added to the end of the introduction.

Comment 3: It appears this review is focused in one setting (USA), and this should be stated, as some guidelines referred to do not necessarily apply to international settings. For example, you comment on the "standard preoperative workup and insurance-mandated medical weight management program", and that "…70% of patients undergoing bariatric surgery have private insurance", but you don't mention the geographic region/s this applies to.

Reply 3: Thank you for bringing up this important point. We have edited this section in the discussion to reframe the context as within the United States and included information regarding practices in Canada and the United Kingdom. We have also added a paragraph to the limitations section highlighting the overrepresentation of North American institutions within the review.

Comment 4: You comment on the heterogeneity of exercise interventions in the studies you have reviewed. It would be useful to know what the existing exercise guidelines are in this patient cohort, or what the justification has been for the variety of programs.

Reply 4: There are currently no evidence-based guidelines regarding the role of perioperative exercise in bariatric surgery, which has contributed to the wide variety of prehabilitation regimens encountered in this review. These details have been added to the discussion.

Comment 5: You might consider expanding on the significance of "reducing postoperative complications, enhancing weight loss, or inducing favorable physiological changes" that prehabilitation may induce, as it is otherwise downplayed by the fact that the existing studies are lacking in homogeneity. This is where the results of meta-analyses are important to cite and will highlight the effect of all the studies combined.

Reply 5: Additional details regarding the potential benefits of prehabilitation have been added to the beginning of the conclusion, along with the relevant citations. References to two meta-analyses have been added to the manuscript as well.

Comment 6: You state "the current evidence surrounding prehabilitation offers inconsistent benefit" and then proceed to make recommendations around only offering prehabilitation to high-risk patients. This would suggest there is existing evidence of minimal/no benefit in lower risk patients (rather than a lack of studies with consistent findings, which is what I think you mean). Please consider re-wording the quoted sentence (line 237) to avoid confusion, and consequently discouraging prehabilitation for anyone aside from high-risk patients.

Reply 6: Thank you for pointing out this discrepancy. The conclusion has been revised, and the above sentence reworded, for better clarification.

Reviewer D

Comment 1: This is a paper that try to review a given literature that is very heterogeneous. The authors did an honest job at doing it. In order to facilitate the reading, a Table should be put together. This will help emphasise the heterogeneity of the literature.

Reply 1: Thank you for this suggestion- an additional table summarizing the included studies has been added as a supplementary file.