Peer Review File

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Reviewer A

This paper is a systematic review, evaluating the effect of physical exercise on shoulder mobility and upper limb function in breast cancer patients post-surgery. This is a beneficial study, aiming to determine the effects of type, intensity, duration, frequency, and timing of exercise on the shoulder and upper limb post breast cancer surgery, however there are currently many areas in which revision is required before giving further consideration for publication. Please see specific comments below.

INTRODUCTION

Line 49-50: Revise whole sentence "Breast cancer (BC), a common affliction among women, is the primary cause of cancer deaths in this demographic", i.e. change "common affliction" to "common condition" and state what proportion/percentage of cancer diagnoses are breast cancer. Any data on typical age range for breast cancer diagnosis?

Thanks to the opinions of experts, we have made changes in the introduction part.

Line 51: What does "succumbing" mean in this context? Being diagnosed with breast cancer? Dying from breast cancer?

How long, generally, does shoulder impairment and upper limb morbidity continue post surgery? Weeks, months, years? Any data on this? How, specifically, does this impact quality of life for cancer survivors after surgery?

Thanks to the opinions of experts. We have revised this statement to include the incidence, duration, and consequences of postoperative shoulder impairment and upper limb morbidity.

Line 60-61: "Evidence suggests that engaging in physical activity is vital for managing breast cancer" - for managing what aspects of breast cancer?

What types of surgical procedures are most common? Breast-conserving surgery, mastectomy, breast reconstruction, lumpectomy, axillary dissection? Need to provide more detail on this in your Introduction.

Thanks to the opinions of experts. We have supplemented the function of physical exercise. In addition, the patients included in this study underwent axillary lymph node dissection and mastectomy.

METHODS

PICOS

Population – any specific inclusion criteria for time since surgery?

Intervention – Please rephrase, meaning is not clear here.

Thank you for your advice. We have checked and revised it.

Line 147: “Using the risk of bias tool recommended by the Cochrane Handbook” - please provide a reference for this.

Thank you for your advice. We have added references.

Line 161: Change “A systematic search using computers” to “A systematic online search…”

Thank you for your advice. We have checked and revised it.

Line 172: “The patients' ages varied from 28to 77 years” – what is the mean and SD for participant age?

Thank you for your advice. We have checked and revised it. The youngest patient was only 28 years old, the patients in the study Sun2020 were the oldest on average(66.2±10.6).

Line 177: What was the mean or most common frequency or exercise sessions (i.e. days/week)? You have only mentioned range

Thank you for your advice. We have checked and revised it. The exercise regimen varied from 1 to 7 days per week, 8 studies (11 RCTs) set the frequency of exercise to three or more times per week, 7 studies less than three times per week, and 5 studies did not report.Each session lasting over 10 minutes.

PRISMA flow chart: Incorrect data in “Records after duplicates removed” and “Records screened”. Need to switch these around. i.e. Should be “Records after duplicates removed (n = 3343)” and “Records screened (n=997)”.

What does “Meeting literature” mean as a reason for excluding articles?

RESULTS

Line 172-175: Need to provide more information on types of exercise interventions included. Rather than just listing them, what were the percentages, proportions or number of studies that used each type of exercise?

We extend our gratitude to the reviewers for their insightful suggestions, which have led us to enhance our manuscript by including a comprehensive breakdown of the proportion of each exercise.

Line 177-181: Need more detail on features of the exercise intervention, e.g. for session length, you’ve only said “each session lasting over 10 minutes”. This is very vague, what was the range and mean duration of exercise sessions? Likewise for other parameters of the exercise interventions, what were the most common frequencies, durations, etc.?

We sincerely appreciate the reviewers' valuable suggestions, which prompted us to enhance Section 2.2 of the results with a more detailed description of the exercise parameters.

Figure 3 & Figure 4: Change figure caption from “forest map” to “forest plot”

We thank the reviewers for their constructive feedback, which we have carefully addressed in our revisions.

Figure 4: Remove “joint” from figure caption

We thank the reviewers for their constructive feedback, which we have carefully addressed in our revisions.

Don’t need to capitalize “M” in “meta-analysis” – please change throughout paper

We thank the reviewers for their constructive feedback, which we have carefully addressed in our revisions.

Line: “Chinese traditional exercise” was not specifically listed as an included exercise intervention in section “2.2 Basic features of included studies”, but is mentioned in section “2.4.2 Impact of Physical Exercise on Upper Limb Motor Function” (line 249-250). Which forms of exercise were “Chinese traditional exercise”? Need to define this early in the manuscript if you are going to evaluate this as a category of exercise. Similar for “comprehensive exercise”, this is not mentioned in “2.2 Basic features of included studies”, but is described as an exercise category in section “2.4.1 Impact of Physical Exercise on Shoulder Mobility Post-Surgery in Breast” (line 217) and “2.4.2 Impact of Physical Exercise on Upper Limb Motor Function” (line 253. What is “comprehensive exercise”? This has not been adequately defined.

We appreciate the reviewers' insightful suggestions, which have significantly enhanced the scientific rigor of our paper. Firstly, we revised Section 2.2 to update the basic characteristics of the included literature, categorizing them according to the latest research findings. Additionally, to improve readability, we have supplemented Section 1.4 with detailed definitions.

Classification of sports in this study	Definition and Composition of Included Programs
Chinese traditional exercises	Chinese traditional exercises, grounded in the rich heritage of Chinese culture, emphasize martial arts techniques and incorporate routines, combat forms, and exercise practices as primary activities. This study encompasses traditional physical activities, including Tai Chi, Baduanjin, and Yangge dance.
Resistance exercise	Resistance exercise involves the active engagement of muscles in overcoming external resistance. This study incorporates various forms of resistance training, including equipment-based resistance

	exercises, progressive resistance training, and isokinetic strength training.
Aerobic exercise + Resistance exercise	Aerobic exercise is characterized by activities that predominantly rely on aerobic metabolism to meet energy demands. Resistance exercise entails the active engagement of muscles in overcoming external resistance. This study encompasses combined aerobic and resistance exercises, integrating both types of exercise interventions.
Ball exercise	Ball games refer to sports or recreational activities that fundamentally involve the use of a ball. This study encompasses ball games, specifically Swiss ball exercises and football.
comprehensive exercise	Comprehensive exercise entails the integration of multiple exercise modalities and training methodologies. This study encompasses various comprehensive exercises, including progressive combined exercises, rehabilitation exercises, inertia training, proprioceptive neuromuscular facilitation, therapeutic exercises, and home-based exercises.

Table 2: "Shoulder joint forward bend" – do you mean "Shoulder flexion"? If yes, please change, or clarify what you mean here.

Need to add lines between sections to aid in clarity of data presentation

We appreciate the reviewers' suggestions, and acknowledge that the issue stemmed from translation errors, which we have now corrected.

Need to explicitly mention "Egger's test in Methods, to link it with your comments in Results section.

We thank the reviewers for their suggestions, which prompted us to make enhancements to the methodology section.

Need to explicitly mention "GRADEPro" test in Methods, to link it with your comments in Results and Discussion sections.

We appreciate the reviewers' insightful feedback, leading us to enrich the methodology section with additional details.

Need to link tests used, with results presented and conclusions reached. Which tests were meta-analyses conducted for? This is not clear.

We are grateful for the reviewers' constructive suggestions, which led us to reorganize the logical flow of the discussion analysis and provide a more detailed introduction in the first paragraph of the discussion section.

DISCUSSION

Line 363-365 "Traditional Chinese exercises, such as Tai Chi, which are characterized by their flexibility, stability, slowness, and continuity, can improve upper limb function" - please provide a reference to support this statement.

Thank you for your advice. We have to add references.

Generally, need to ensure that all statements in your discussion are supported by adequate referencing, and actually have a clear link with your study findings. Please check this and

amend.
Thank you for your advice. We have checked and revised it.

Line 372-374: “This effectiveness may also be influenced by the type of surgery the patient has undergone, as different surgical procedures can result in varying degrees of upper limb dysfunction” – you have not provided any information on the type of surgical procedures participants underwent in the included studies, so comments about the potential influence of type of surgery do not add to the discussion here.
Thank you for your advice. In order to avoid controversy, we have decided to delete this content after discussion.

Reviewer B

The aim of the present investigation was to evaluate how physical exercise impacts shoulder mobility and upper limb function in breast cancer patients post-surgery, examining various aspects of exercise such as type, intensity, duration, frequency, and intervention timing to determine their influence on outcomes.

GENERAL COMMENTS

The article is in-line with the journal topic, but some aspects must be considered. The systematic review and meta-analysis are interesting, but the present investigation needs an accurate revision of the methodology and the results presentation in order to be considered for publication.

Abstract
It should be specified that all 20 studies are included for both the systematic review and the meta-analysis.
Thank you for your advice. We have checked and revised it.

Introduction
The manuscript presents a fairly adequate standard of writing. The structure is clear and organized, starting with an abstract that provides a concise overview of the content. Sections are well delimited (Background, Case Presentation, Discussion, etc.), which facilitates reading and comprehension. Its language is professional and technical.
Thank you for your advice. We have further improved it.

Methods
Breast cancer patients are included, but it is not specified what type of surgery these patients underwent (conservative surgery, radical surgery, selective sentinel lymph node biopsy, axillary lymph node emptying) nor the type of oncological treatment applied (if there was adjuvant chemotherapy, radiotherapy, hormone therapy). I think these factors have to be considered as they influence the variables to be studied (range of movement -abduction, shoulder flexion- and

functionality).
Thank you for your advice. This is a shortcoming of our study, which is explained in the limitation section.

The duration of the interventions are also very variable, some interventions last only one day a week while others interventions last 7 days a week.
Thank you for your advice. We searched the database comprehensively, included and analyzed the RCTS related to physical exercise, and conducted subgroup analysis.

It would be helpful to include a column in Table 1 summarising the results of the clinical trials included in the review.
Thank you for your advice. We have checked and revised it.

In some studies, the control-intervention groups are small (out of the 20 included studies, 4 of them have a total of 30 patients or less) or with varying sample sizes (e.g. Portela et al. 2008 13/9 or Mariano et al. 2015 6/7).

8 of the 20 clinical trials included, were published more than 10 years ago.

Thank you for your advice. Our search strategy does not limit the age of publication, seeks to systematically analyze randomized controlled trials that investigate the effects of physical exercise on postoperative shoulder mobility and upper limb function in breast cancer patients, using an evidence-based approach.

Results
I find it impressive that 20 studies were included in the systematic review, and that these 20 studies could also be included in the meta-analysis without losing any for the functionality variable.
We sincerely appreciate the reviewers' thoughtful suggestions.
Discussion
As it is stated in the text, conclusions should be interpreted with caution. Therefore, there should be a section on the limitations and weaknesses of the study.
Thank you for your advice, we have to add this part

Reference 15 in their bibliography (Yang Y et al. 2021) contains very similar information to the present study, and I believe it would be interesting to draw further comparisons and similarities between the two studies within this section.
Thanks for your suggestion, we have added this article to the discussion and analysis.

Axillary Web Syndrome (AWS) is not considered a possible sequela after breast cancer that limits both shoulder mobility and function. AWS is quite common and is often the cause of limited mobility in these patients (Yeung WM, McPhail SM, Kuys SS. A systematic review of axillary web syndrome (AWS). J Cancer Surviv. 2015 Dec;9(4):576-98. doi: 10.1007/s11764-015-0435-1. Epub 2015 Feb 15. PMID: 25682072).
Thank you for your advice, as a result of the discussion, to avoid controversy, we have to remove this part of contents.