

Peer Review File

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Reviewer A

1) First, the abstract needs further revisions. The background did not indicate the controversy on the research focus and why a meta-analysis is needed to address the controversy. The methods need to describe the inclusion criteria for eligible studies according to the PICOS principles and risk of bias assessment of included studies. The results need to describe the risk of bias of included studies and the interventions in the control group. The discussion needs comments for the clinical implications of the findings, not to repeat the main findings again.

Reply: Thank you for your comment. The PICOS principle has been specifically elaborated in the method section, and due to the limitation of the number of abstract characters, we will not repeat it here. We have modified the background, methods, results and discussion in the abstract.

Changes in the text: Paragraph 1,2,3,4 / Abstract

2) Second, the introduction is bad. The authors need to review the controversy regarding the efficacy of exercise intervention for improving QOL in BC patients, analyze the potential reasons for the controversy, and explain why a meta-analysis is suitable to address this controversy. It is wrong to cite the heterogeneity in the intervention of exercise, because meta-analysis cannot address such variation. Outcome measures other than EORTC QLQ-C30 can also denote the improvement in QOL, but the authors did not explain the focus on EORTC QLQ-C30 only in a convincing manner.

Reply: Thank you for your comment. The difference of people's race and living habits in different regions will indirectly affect the quality of life of breast cancer patients in different regions and the impact of exercise on them. At present, the research on rehabilitation exercise and quality of life of breast cancer is heterogeneous, and the results are also contradictory. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30 (EORTC QLQ-C30) is the most widely used method internationally to measure the quality of life of cancer patients. This scale can provide a quantitative assessment of the quality of life of cancer patients. We have added this section in the introduction section.

Changes in the text: Paragraph 1,3,4 / Introduction

3) Third, in the methodology of the main text, it is inappropriate to limit the publication dates of studies to be 2010-2022 and the search within CNKI only for Chinese-language databases is inadequate. In the inclusion criteria, please specify the definitions of exercise and the intervention in the control group; for example, what “certain intensity, time, and frequency” are and did “not exercise” include care as usual or medication treatment. The clinical heterogeneity in the interventions of the interventions and control groups is very important and should not be ignored. The authors need to report the details of the risk of bias assessment and criteria for low and high risk of bias of included studies. In statistics, please specify the module for pooling the mean differences in QOL scores and effect size measures. The number of included studies is lower than 10, so Begg’s test is not feasible. Please consider failed-safe numbers. The authors need to describe the subgroup analysis for ascertaining the sources of heterogeneity in included studies.

Reply: Thank you for your comment. We have modified and supplemented the method section. We have also added the Wanfang database. We have added evaluation criteria in the method section and analyzed the risk bias assessment results in the results section. The Begg’s test is not suitable, we have removed this section.

Changes in the text: Paragraph 1,2,6,7 / Methods; Paragraph 3/ Results

Reviewer B

The paper titled “The effects of exercise on the quality of life of patients with breast cancer: a meta-analysis based on the QLQ-C30 quality of life scale” is interesting. Exercise can significantly improve the overall physical health and body functions (physiological function, daily life function, emotional function, social function) of BC survivors. Exercise can also significantly reduce the symptoms of fatigue, nausea, vomiting, and insomnia in BC patients. Exercise therapy has the potential to be used as an adjuvant therapy for BC survivors to substantially improve the QoL of patients. However, there are several minor issues that if addressed would significantly improve the manuscript.

1) This study is based on the analysis and summary of the literatures. It is suggested to add clinical experimental research, which may be more meaningful.

Reply: Thank you for your comment. This is the limitation of this article. We have added the limitations of this meta-analysis and suggestions for future research directions in the discussion section.

Changes in the text: Paragraph 12 / Discussion

2) Besides exercise, what other methods can improve the quality of life of breast cancer patients? What is the biggest advantage of exercise? Suggest adding relevant content.

Reply: Thank you for your comment. We have added relevant content in the discussion section.

Changes in the text: Paragraph 3 / Discussion

3) In the introduction of the manuscript, it is necessary to clearly indicate the knowledge gaps and limitations of prior study and the clinical significance of this study.

Reply: Thank you for your comment. Because of the different races and medical habits in different regions, these will indirectly affect the quality of life of breast cancer patients in different regions and the impact of exercise on them. We have already added relevant content in the introduction.

Changes in the text: Paragraph 3 / Introduction

4) There are many databases. Why did the author select PubMed, Embase, Cochrane Library, and CNKI databases in this study for searching? Please explain the reason.

Reply: Thank you for your comment. Because PubMed is the most commonly used data in medical related databases in English, with a relatively large coverage range, and EMBase and Cochrane Library have been added as supplementary data. For Chinese databases, CNKI is chosen as the representative database. So, a comprehensive selection of these specific representative Chinese and English databases can cover new research in recent years. We have also added the Wanfang database.

Changes in the text: Paragraph 1 /Methods, figure1.

5) What are the modifiable factors associated with quality of life of breast cancer? It is recommended to add relevant content.

Reply: Thank you for your comment. After undergoing surgery, radiotherapy, chemotherapy and endocrine therapy, breast cancer patients enter a long recovery period. Breast cancer rehabilitation includes three aspects: physical, psychological and social life. We added it in the discussion section.

Changes in the text: Paragraph 12 / Discussion

6) The introduction part of this paper is not comprehensive enough, and the similar papers have not been cited, such as “Effects of continuous aerobic exercise on lung function and quality of life with asthma: a systematic review and meta-analysis, J Thorac Dis, PMID: 33145051”. It is recommended to quote this article.

Reply: Thank you for your comment. We have cited this literature as number 16.

Changes in the text: Paragraph 2/ Introduction

7) What are the differences in the quality of life of breast cancer patients in different regions? What are the possible factors? Suggest adding relevant content.

Reply: Thank you for your comment. We have added it in the introduction section.

Changes in the text: Paragraph 2 / Introduction

Reviewer C

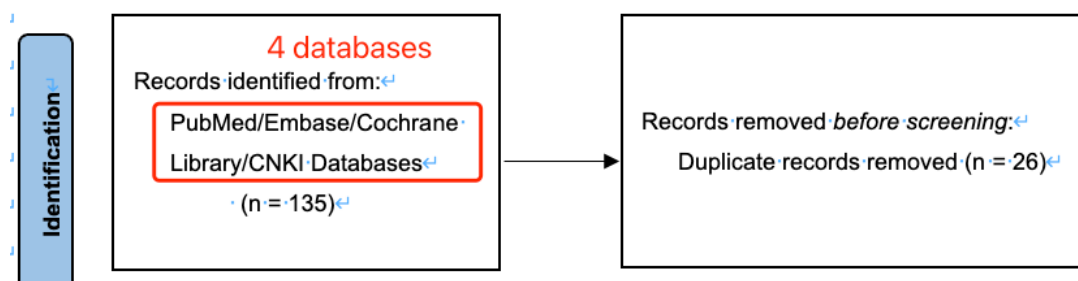
1. Figure 1

a) Please revise figure 1, one more database was added to the main text.

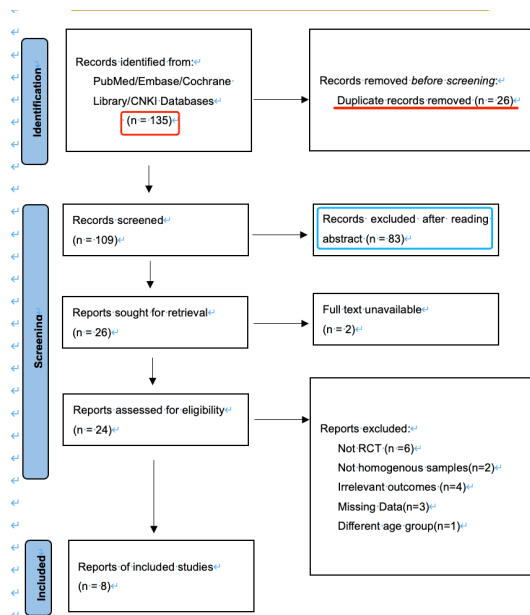
160 study extracted English and Chinese literature published until December 2022 from the
161 databases of PubMed, Embase, Cochrane Library, Wanfang, and China National
162 Knowledge Infrastructure (CNKI). The literature search mainly uses the combination

228 ## Literature search and screening results

229 A total of 112 studies were extracted from 5 databases through the above retrieval
230 methods. After excluding duplicate articles, a total of 135 original studies were



b) Please check the data, the main text should be the same as the figure.



227 **#Results**
 228 **## Literature search and screening results**
 229 A total of 112 studies were extracted from 5 databases through the above retrieval
 230 methods. After excluding duplicate articles, a total of 135 original studies were
 231 extracted. By browsing titles, keywords, and abstracts, 26 of these studies were
 232 identified as potentially relevant to the research topic. We further searched the full text
 233 of these studies and obtained the full text of a total of 24 studies. Based on the inclusion
 234 and exclusion criteria, we excluded a further 16 studies. Finally, a total of 8 studies (21-

239 28) were included in this meta-analysis. The literature screening process is shown in
 240 Figure 1.

241
 242 **## Basic characteristics of the included studies**

243 All 8 included literatures were original studies (21-28). The total sample included 1,248
 244 BC patients, including 639 cases in the exercise intervention experimental group and
 245 609 cases in the non-exercise control group (Table 1).

246
 247 **## Quality assessment of included literature**

Reply: Thank you for your suggestion, we have revised it.

2. Figure 2

Please explain the meaning of the white blanks, they should be filled.

Aydin 2021	+	+		+	+		
Montagnese 2020	+	+		+	+	+	+
MOROS 2010	-	+	+	+	+		
Pasyar 2019	+	+	+	+	+	+	+
SAARTO 2012		+	+	+	+	+	
Schmidt 2015		+	+	+	+	+	+
Shobeiri 2016	+		-	+		+	
Zhu 2020	+	+	+	+	+	+	+

Reply: Thank you for your suggestion, the figure has been revised.

3. Figures

In all figures, MOROS and SAARTO should be revised to Moros and Saarto, please check and revise.

MOROS 2010	-	+	+	+	+		
Pasyar 2019	+	+	+	+	+	+	+
SAARTO 2012		+	+	+	+	+	

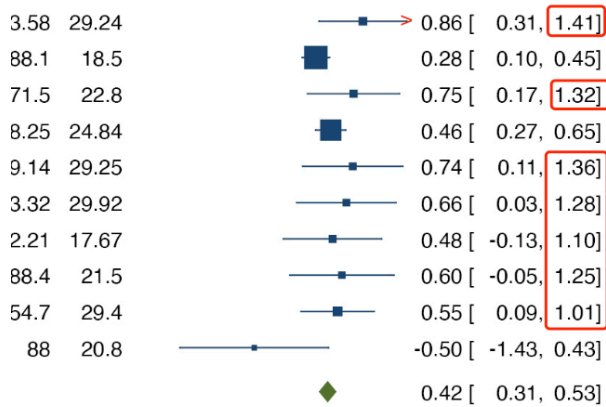
SAARTO 2012 263 74 18.2 263 69.8 17.8

MOROS 2010 10 70 18.9 7 60.7 19

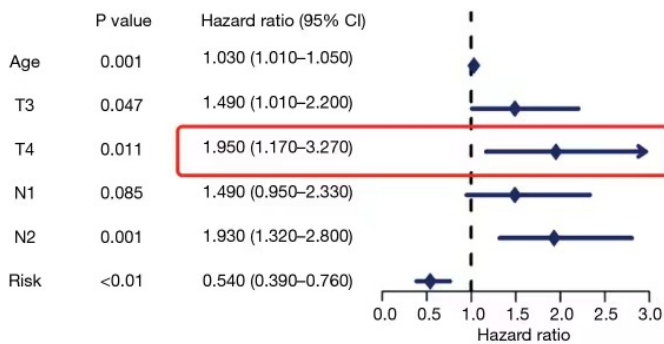
Reply: Thank you for your suggestion, the figures has been revised

4. Figure 9

To standardize the results, the part that exceeds the horizontal coordinates should be indicated by arrows.



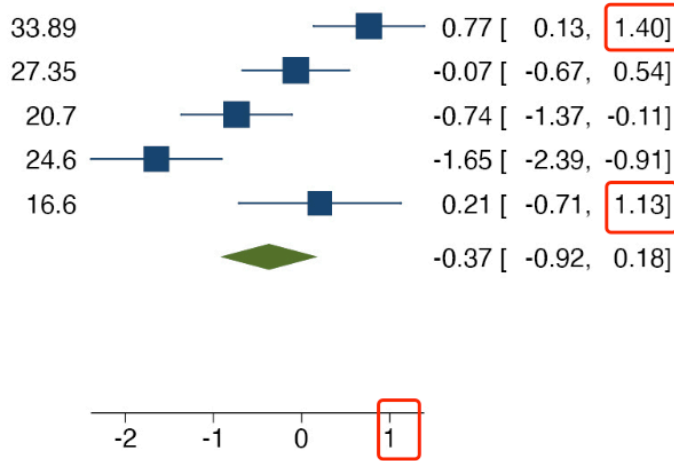
Please see the example below:



Reply: Thank you for your suggestion, the figure has been revised.

5. Figure 12

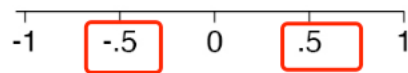
To standardize the results, the part that exceeds the horizontal coordinates should be indicated by arrows.



Reply: Thank you for your suggestion, the figure has been revised.

6. Figure 16 and 17

Please revise the x-axis to -0.5 and 0.5



Reply: Thank you for your suggestion, the figures has been revised.

7. References/Citations

a) References 30 and 32 are the same, please delete one of them and revise both the citation in main text and reference list's order.

Reply: Thank you for your suggestion, we have revised it.

b) References 11 and 41 are the same, please delete one of them and revise both the citation in main text and reference list's order.

Reply: Thank you for your suggestion, we have revised it.

c) Please double-check if citations should be added as you mentioned “studies”.

*Please note that the references should be cited in order of their appearance in the text.

If the studies are not included in the reference list, please also update the current version.

140 ~~Some studies have proposed that~~ rehabilitation exercise can reduce the
 141 cardiopulmonary adverse reactions, bone loss and incidence rate of fractures caused by
 142 cancer surgery or chemotherapy, and improve the quality of life of patients. However,

Reply: Thank you for your suggestion, we have revised it.