INPLASY PROTOCOL

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Effect of exercise on rehabilitation of breast cancer surgery patients: A systematic review and meta-analysis of randomized controlled trials

Lin, YW[1]; Chen, Y[2]; Liu, R3; Cao, BH[4].

Review question / Objective: **Exercise after breast cancer surgery has proved beneficial to rehabilitation. We evaluate the best exercise for different post-surgery complications.**
Information sources: **China National Knowledge Infrastructure, Wanfang Data Knowledge Service Platform, VIP China Science and Technology Journal Database, China Biology Medicine, EMBASE and PubMed databases were searched. Combinations of breast cancer ("breast tumor", "breast carcinoma","mammary carcinoma","breast neoplasm") and rehabilitation exercise ("exercise","physical therapy") were employed when screening abstracts/keywords of articles. Two researchers independently searched, read the title and abstract of the literature, read the full text of the preliminary included literature, and extracted the data. In case of divergence, a third researcher was consulted.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 October 2022 and was last updated on 17 October 2022 (registration number INPLASY2022100065).

INTRODUCTION

Review question / Objective: **Exercise after breast cancer surgery has proved beneficial to rehabilitation. We evaluate the best exercise for different post-surgery complications.**

Condition being studied: **As early as the 1990s, rehabilitation exercise was used after breast cancer surgery, and exercise proved to be beneficial for recovery. Currently, increasingly diversified rehabilitation exercises are being used, the methods include resistance exercise, shoulder and elbow exercise, lymphatic drainage, aerobic exercise, physiotherapy and massage, etc. Exercise is often used to promote recovery following breast cancer surgery. Some research suggests that,**

aerobic exercise can improve the range of motion of the shoulder. This reveals the importance of aerobic exercise. But another study involving 28 researchers showed that it had no effect on improving shoulder range of motion.In recent years, resistance movement has been found to relieve pain. Although previous researches demonstrated resistance movement are effective, some studies revealed that such interventions have not achieved significant results, researchers speculate that this may be affected by the insufficient intensity of resistance exercise interventions and differences exercise content also lead to different effects.

Postoperative complications are distressing and difficult experiences for women. The impact of it on women is not limited to the physical dimension but also influences of family and social adaptation. Existing literature supports that exercise can play an important role in postoperative rehabilitation. However, the study results on the effectiveness of exercise by them are inconsistent. In addition, there was no clear indication about which type of exercise is most efficacious for different postoperative complications. Therefore, a systematic review and meta-analysis was conducted to find the best exercise modality to alleviate several types of postoperative conditions.

METHODS

Participant or population: Breast cancer surgery patients.

Intervention: Rehabilitation exercise.

Comparator: Rehabilitation exercise.

Study designs to be included: To be included in the meta-analysis and review, studies must have been randomized controlled trials of patients after breast cancer surgery.

Eligibility criteria: To be included in the meta-analysis and review, studies must have been randomized controlled trials of patients after breast cancer surgery, including breast conserving surgery, radical mastectomy, modified radical mastectomy, axillary lymph node dissection and breast cancer associated lymphedema. Quantitative outcome indicators were specific intervention measures. Studies were excluded if the results and intervention measures were not clear, the outcome indicators were not clear, the quality of literature was lower than three points, the publications were repeated, and there was no full text.

Information sources: China National Knowledge Infrastructure, Wanfang Data Knowledge Service Platform, VIP China Science and Technology Journal Database, China Biology Medicine, EMBASE and PubMed databases were searched. Combinations of breast cancer ("breast tumor","breast carcinoma","mammary carcinoma","breast neoplasm") and rehabilitation exercise ("exercise","physical therapy") were employed when screening abstracts/keywords of articles. Two researchers independently searched, read the title and abstract of the literature, read the full text of the preliminary included literature, and extracted the data. In case of divergence, a third researcher was consulted.

Main outcome(s): Pain degree, shoulder joint range of motion, upper limb dysfunction, muscle strength, and lymphedema.

Quality assessment / Risk of bias analysis: The modified Jadad scale(Jadad et al., 1996) was used to evaluate the quality of the included literature. The total score was 7 points, 1-3 points for low-quality literature and 4-7 points for high-quality literature. Low quality literature was excluded.

Strategy of data synthesis: CMA2.0 software was used for meta-analysis. Statistical heterogeneity was assessed by the I2-heterogeneity test. $P < 0.10$, $I2 \geq 60\%$, with an indicating high heterogeneity, and random effect model was selected; $P \geq 0.10$, $I2 < 60\%$, with an indicating low heterogeneity, fixed effect model was selected to draw forest map. We did not

perform the funnel plot or Egger's test to evaluate publication bias because tests for funnel plot asymmetry should be used only when there are at least 10 studies included for adequate power.

Subgroup analysis: None.

Sensitivity analysis: None.

Country(ies) involved: China.

Keywords: breast cancer; meta-analysis; rehabilitation exercise; surgery.

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Author 1 - Yawei Lin - Author 1 drafted the manuscript.
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Author 3 - Rongrong Liu - The author contributed to the development of the selection criteria, and the risk of bias assessment strategy.
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