INPLASY

Self-Managed Non-Pharmacological Interventions for Post-treatment Upper Limb Dysfunction among Breast Cancer Survivors: A Systematic Review Protocol

INPLASY2025110066

doi: 10.37766/inplasy2025.11.0066

Received: 21 November 2025

Published: 21 November 2025

Li, JQ; Tan, JY; Wang, T; Wang, HY; Li, MY; Sharma, S; Deravin L; Terry, D.

Corresponding author:
Daniel Terry

daniel.terry@unisq.edu.au

Author Affiliation:
University of Southern Queensland.

ADMINISTRATIVE INFORMATION

Support - The authors declare that no funds, grants, or other support were received.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025110066

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 November 2025 and was last updated on 21 November 2025.

INTRODUCTION

Review question / Objective To identify commonly utilised self-managed non-pharmacological interventions for post-treatment upper limb dysfunction (ULD) among breast cancer survivors, evaluate their effectiveness and safety, and identify the research gap for future studies.

Condition being studied Breast cancer is the leading cancer for females and the second most common cancer worldwide, with approximately 2.3 million new cases and 670,000 deaths globally (WHO, 2024). ULD is one of the most common long-term sequelae after surgical treatment for breast cancer survivors. The prevalence of persistent/post-treatment ULD ranges from 51% to 70%, attributed to variations in diagnostic methods, criteria, measurement instruments, and the timing (Bruce et al., 2022; Jariwala & Kaur, 2021; McNeely et al., 2023; Siqueira et al., 2021). Persistent ULD may result in physical, mental, and economic effects and decrease overall quality of life (Johnson et al., 2024; Macdonald et al., 2024).

METHODS

Search strategy MeSH terms and free words will be used to develop the search strategies. Boolean operators will be applied to generate the search strategy.
The details of the search strategy for PubMed are as follows:
("Breast Neoplasms"[MeSH Terms] OR ("breast neoplasm*"[Title/Abstract] OR "breast tumor*"[Title/Abstract] OR "breast cancer*"[Title/Abstract] OR "mammary cancer*"[Title/Abstract] OR "breast carcinoma*"[Title/Abstract] OR "breast malignancy"[Title/Abstract])) AND ("upper limb*"[Title/Abstract] OR "shoulder*"[Title/Abstract] OR "Upper extremity"[Title/Abstract] OR "Upper

body"[Title/Abstract] OR "upper quarter*"[Title/Abstract] OR "elbow joint*"[Title/Abstract] OR "Handgrip strength"[Title/Abstract]) AND ("Randomized Controlled Trial"[Publication Type] OR "random*"[Title/Abstract] OR "control*"[Title/Abstract] OR "trial*"[Title/Abstract]
Similar search strategies will be adopted for other databases.

Participant or population Patients with breast cancer diagnosed at stages I-III who have completed the main treatment (surgery, radiotherapy, and chemotherapy) and were experiencing ULD are the target population.

Intervention Included studies must adopt at least one type of self-managed non-pharmacological interventions to improve breast cancer-related ULD. Self-managed non-pharmacological interventions refer to the non-pharmacological strategies that patients independently carry out, with or without the support of family members, community resources, and healthcare professionals, to manage the physical and psychological issues associated with chronic conditions (Cuthbert et al., 2019). Some commonly recommended self-managed non-pharmacological interventions include physical activity/exercise, meditation, hypnosis, yoga, music therapy, stress management, relaxation, massage, and acupressure (Tan et al., 2022).

Comparator Studies have a control arm using either inactive interventions (such as usual care, placebo, or waiting list) or active interventions.

Study designs to be included Only Randomised Controlled Trials will be included.

Eligibility criteria •Outcome: Studies that assessed upper limb function using validated instruments will be included, such as the Disability of Arm, Shoulder, and Hand (DASH) or QuickDASH, regardless of whether they are the primary or secondary outcome in the included studies (Beaton et al., 2005; Hudak et al., 1996).
•Published in English with an accessible full text.

Information sources (1) Two reviewers searched studies in the following eight electronic databases: PubMed, Cochrane Library, Embase, CINAHL, Web of Science, Scopus, PsycINFO, and ProQuest One Academic, from the inception of each database to 30 September 2025.
(2) Manual search: Google and ResearchGate will be searched manually to identify grey literature. References of the included studies have been reviewed to identify alternative research not captured by the initial search.

Main outcome(s) The primary outcome was the effectiveness of self-managed non-pharmacological interventions in reducing ULD, as assessed by validated instruments such as the DASH and QuickDASH. The secondary outcomes included the effects of these interventions on other upper limb impairments associated with breast cancer treatment, such as pain, shoulder range of motion (ROM), and upper limb strength, and the safety of the interventions, evaluated through the reporting of adverse events.

Data management Initial search results were imported into Covidence for screening and data extraction.

Quality assessment / Risk of bias analysis The Risk of Bias version 2 (RoB 2) will be used to assess the quality of the included studies (Sterne et al., 2019). Two independent reviewers (JQL and MYL) will perform the assessments, and any discrepancies will be resolved through discussion with a third reviewer (BT).

Strategy of data synthesis Outcomes will be pooled for meta-analysis. If the data are clinically heterogeneous, descriptive analysis will be used to report the effectiveness of interventions on long-term ULD rehabilitation. Research gaps and further directions will be summarised and reported.

Subgroup analysis Subgroup analysis may be conducted based on the types of interventions, either through quantitative synthesis or descriptive analysis, depending on the data availability.

Sensitivity analysis NA.

Language restriction English.

Country(ies) involved Australia.

Keywords non-pharmacological; breast cancer; survivor; upper limb dysfunction; systematic review.

Dissemination plans The systematic review will be published in a peer-reviewed journal.

Contributions of each author
Author 1 - Jinqiu Li - Conceptualisation, data curation, formal analysis, and writing-original draft.
Email: jinqiu.li@unisq.edu.au

Author 2 - Jing-Yu (Benjamin) Tan - Conceptualisation, supervision, and writing-review & editing.
Email: benjamin.tan@unisq.edu.au
Author 3 - Tao Wang - Conceptualisation, supervision, and writing-review & editing.
Email: alison.wang@unisq.edu.au
Author 4 - Haiying Wang - Conceptualisation, supervision, and writing-review & editing.
Email: emily.wang@unisq.edu.au
Author 5 - Mengyuan Li - Data curation and formal analysis.
Email: mengyuan.li@unisq.edu.au
Author 6 - Sita Sharma - Conceptualisation, supervision, and writing-review & editing.
Email: sita.sharma@unisq.edu.au
Author 7 - Linda Deravin - Conceptualisation, supervision, and writing-review &editing.
Email: linda.deravin@unisq.edu.au
Author 8 - Daniel Terry - Conceptualisation, supervision, and writing-review & editing.
Email: daniel.terry@unisq.edu.au

Reference:

Beaton, D. E., Wright, J. G., & Katz, J. N. (2005). Development of the QuickDASH: comparison of three item-reduction approaches. J Bone Joint Surg Am, 87(5), 1038-1046. https://doi.org/10.2106/jbjs.D.02060

Bruce, J., Mazuquin, B., Mistry, P., Rees, S., Canaway, A., Hossain, A., Williamson, E., Padfield, E. J., Lall, R., Richmond, H., Chowdhury, L., Lait, C., Petrou, S., Booth, K., Lamb, S. E., Vidya, R., & Thompson, A. M. (2022). Exercise to prevent shoulder problems after breast cancer surgery: the PROSPER RCT. Health Technol Assess, 26(15), 1-124. https://doi.org/10.3310/jknz2003

Cancer Today. (2024). World Health Organization. Retrieved 10/11 from https://gco.iarc.who.int/today/en/dataviz/bars?mode=cancer&group_populations=1&sexes=2&types=0&sort_by=value0

Cuthbert, C. A., Farragher, J. F., Hemmelgarn, B. R., Ding, Q., McKinnon, G. P., & Cheung, W. Y. (2019). Self-management interventions for cancer survivors: A systematic review and evaluation of intervention content and theories. Psycho-oncology, 28(11), 2119–2140. https://doi.org/10.1002/pon.5215

Sterne, J. A. C., Savović, J., Page, M. J., Elbers, R. G., Blencowe, N. S., Boutron, I., Cates, C. J., Cheng, H.-Y., Corbett, M. S., Eldridge, S. M., Emberson, J. R., Hernán, M. A., Hopewell, S., Hróbjartsson, A., Junqueira, D. R., Jüni, P., Kirkham, J. J., Lasserson, T., Li, T., . . . Higgins, J. P. T. (2019). RoB 2: a revised tool for assessing risk of bias in randomised trials. Bmj, 366.

Hudak, P. L., Amadio, P. C., & Bombardier, C. (1996). Development of an upper extremity outcome measure: the DASH (disabilities of the arm, shoulder and hand). Am J Ind Med, 29(6), 602-608. https://doi.org/10.1002/(sici)1097-0274(199606)29:63.0.Co;2-l

Jariwala, P., & Kaur, N. (2021). A descriptive study on prevalence of arm/shoulder problems and its impact on quality of life in breast cancer survivors. Indian J Cancer, 58(2), 201-206. https://doi.org/10.4103/ijc.IJC_22_19

Johnson, M. C., McGregor, A. H., A'Hern, R., Leff, D. R., & Wells, M. (2024). 'I presumed the pain would eventually get better by itself'; challenges with access to rehabilitation for upper limb dysfunction after breast cancer treatment – Descriptive and qualitative findings from a cross-sectional survey. Eur J Surg Oncol, 50(10), 108591. https://doi.org/10.1016/j.ejso.2024.108591

Macdonald, E. R., Amorim, N. M. L., Hagstrom, A. D., Markovic, K., Simar, D., Ward, R. E., & Clifford, B. K. (2024). Evaluating the effect of upper-body morbidity on quality of life following primary breast cancer treatment: a systematic review and meta-analysis. J Cancer Surviv, 18(5), 1517-1547. https://doi.org/10.1007/s11764-023-01395-0

McNeely, M. L., Courneya, K. S., Al Onazi, M. M., Wharton, S., Wang, Q., Dickau, L., Vallance, J. K., Culos-Reed, S. N., Matthews, C. E., Yang, L., & Friedenreich, C. M. (2023). Upper Limb Morbidity in Newly Diagnosed Individuals After Unilateral Surgery for Breast Cancer: Baseline Results from the AMBER Cohort Study. Ann Surg Oncol, 30(13), 8389-8397. https://doi.org/10.1245/s10434-023-14316-3

Siqueira, T. C., Frágoas, S. P., Pelegrini, A., de Oliveira, A. R., & da Luz, C. M. (2021). Factors associated with upper limb dysfunction in breast cancer survivors. Support Care Cancer, 29(4), 1933-1940. https://doi.org/10.1007/s00520-020-05668-7

Tan, J. B., Zhai, J., Wang, T., Zhou, H. J., Zhao, I., & Liu, X. L. (2022). Self-Managed Non-Pharmacological Interventions for Breast Cancer Survivors: Systematic Quality Appraisal and Content Analysis of Clinical Practice Guidelines. Front Oncol, 12, 866284. https://doi.org/10.3389/fonc.2022.866284