Review

Assessment questionnaires for self-reported symptoms of lymphoedema among cancer survivors: A systematic review

Yuanlu Sun, Christiana Oyewusi and Jane M Armer

Key words

Lymphoedema, breast cancer, gynecologic cancer, melanoma, symptom assessment

Yuanlu Sun is Assistant Professor, College of Nursing, University of Iowa, Iowa City, IA, US; Christiana Oyewusi is Graduate Research Assistant, Sinclair School of Nursing, University of Missouri, Columbia, MO, US.; and Jane M Armer is Professor Emerita, Sinclair School of Nursing, University of Missouri, Columbia, MO, US.

Abstract

This review examines the characteristics of primary research utilising the lymphoedema symptom assessment questionnaires, including Lymphedema and Breast Cancer Questionnaire, Gynecologic Cancer and Lymphedema Questionnaire, and Melanoma and Lymphedema Questionnaire. Thirty-one studies were analysed, extracting key characteristics, such as sample demographics, settings, study designs, researcher disciplines, and countries of adoption. The Lymphedema and Breast Cancer Questionnaire, Gynecologic Cancer and Lymphedema Questionnaire, and Melanoma and Lymphedema Questionnaire have been extensively used across diverse geographical locations, research designs, populations, and settings. The results highlight the multidisciplinary nature of the research teams and the broad relevance and utility of these questionnaires in lymphoedema assessment and management. The diverse clinical and community settings for participant recruitment enhance the generalisability of the findings, underscoring the applicability of these tools across various healthcare and community contexts.

Lymphoedema is a chronic and debilitating condition that can arise as a consequence of cancer treatment, particularly lymph node dissection and radiation therapy. It is characterised by the accumulation of protein-rich fluid in the interstitial spaces, resulting from a disruption in the lymphatic transport system (International Society of Lymphology, 2020). Cancer-related lymphoedema is one of the most distressing and underestimated complications of cancer treatment (Chaput & Ibrahim, 2023). It affects a substantial number of cancer survivors, with estimates suggesting that up to 40% of breast cancer patients (Armer and Stewart, 2010; Pereira et al, 2017), 25% of gynaecological cancer patients (Hayes et al, 2017; Khutjwe and Vuyiswa, 2018), and 18% of melanoma patients (Deban et al, 2022) develop lymphoedema following treatment.

Lymphoedema can be debilitating, with associated subjective symptoms, such as feelings of heaviness, numbness, or tingling, which are often reported before the detection of significant extremity volume changes and fluid pockets (Hidding

et al, 2016; Tidhar et al, 2022). Untreated lymphoedema can progress over time and lead to severe complications, such as cellulitis, lymphangitis, septicaemia, and even amputation (Burian et al, 2024). Beyond physical discomfort, it can profoundly affect a survivor's quality of life (Sun and Armer, 2019), often leading to functional limitations and psychological distress (Hayes et al, 2017; Sun et al, 2020). Early detection and treatment of lymphoedema are, therefore, important in reducing the risk of progression and complications and impact on economic and healthcare resources (Armer et al, 2018; Gençay Can et al, 2019; Koelmeyer et al, 2021).

The Lymphedema Breast Cancer Questionnaire (LBCQ) is a semi-structured interview or self-administration tool designed to assess indicators of lymphoedema (*n*=38), their frequency, and symptom self-management strategies. It was developed based on a critical literature review, Leventhal's Common-Sense Model, and qualitative research involving interviews with breast cancer survivors. Clinical experts reviewed the tool while

it was initially tested with breast cancer survivors. The LBCQ elicits responses regarding 19 symptoms occurring currently or in the past year. Participants indicate whether each sign or symptom is present ("yes" or "no"). Scores for total current symptoms and total symptoms in the past year are calculated, with a maximum total symptom score of 38 (Armer et al, 2003).

The Gynecologic Cancer Lymphedema Questionnaire (GCLQ) is an adaptation of the LBCQ by Lockwood, modified to assess symptoms of lower limb lymphoedema (LLE) in gynaecologic cancer survivors (unpublished data). Carter et al (2010) further modified Lockwood's version into a brief, 20-symptom assessment tool with four supplemental items to determine patients' awareness of their lymphoedema diagnosis and utilisation of lymphoedema self-management.

The Melanoma Lymphedema Questionnaire (MELQ) is a modified version of the LBCQ and the Gynecologic Cancer Lymphedema Questionnaire (GCLQ), adapted to assess upper and lower extremity lymphoedema symptoms in melanoma patients. Developed
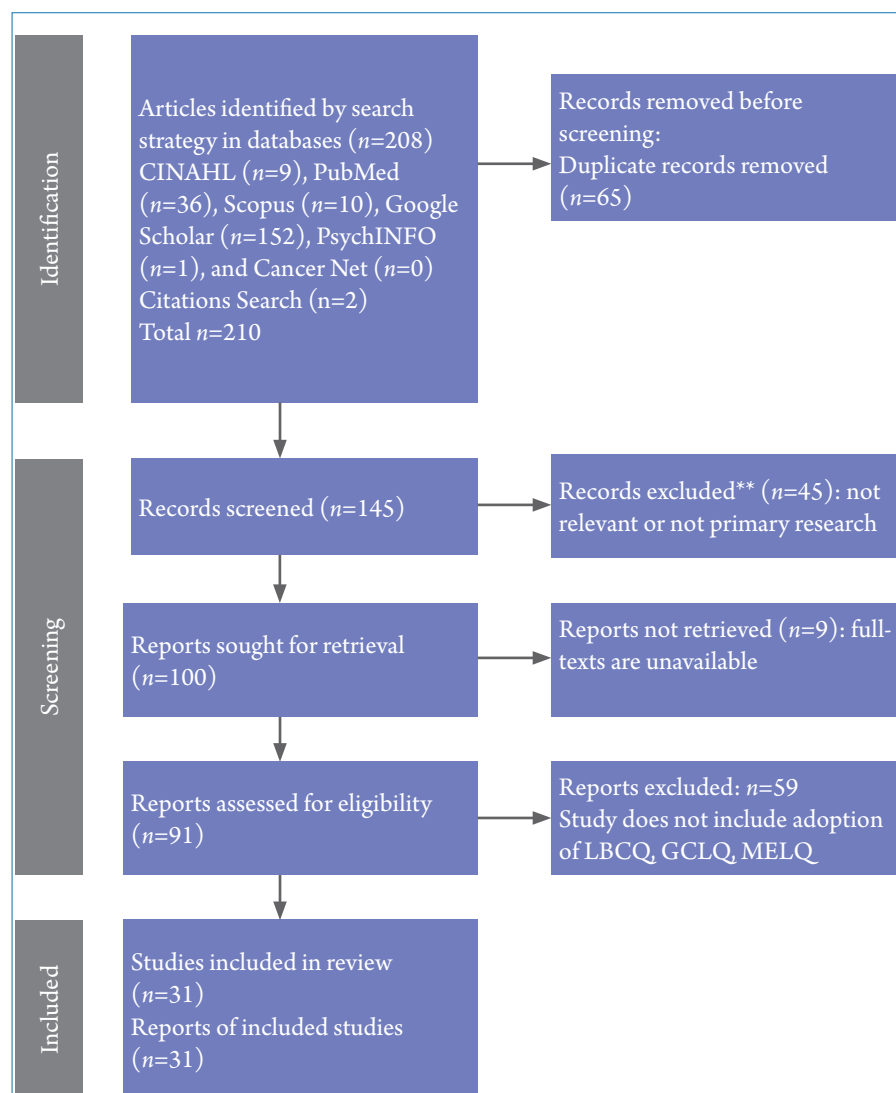
Figure 1. Flow diagram of articles included in this systematic review.

by Cormier et al. (2009) at the MD Anderson Cancer Center, MELQ includes the 19-symptom items from LBCQ (Cormier et al, 2010). MELQ has been used in research studies to evaluate lymphoedema-associated symptoms in melanoma patients undergoing sentinel lymph node biopsy (Hyngstrom et al, 2013).

This review aims to examine the research characteristics of primary studies utilising the lymphoedema symptom assessment questionnaires, including the LBCQ, GCLQ and MELQ.

Methods

Search strategy
This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

guidelines (*Figure 1*). Six databases (CINAHL, PubMed, Scopus, Google Scholar, PsychINFO, and Cancer Net) were searched for publications between January 1998 and December 2018 using relevant MeSH terms and keywords related to the LBCQ, GCLQ, and MELQ. The search terms included combinations of "lymphoedema," "breast cancer," "gynaecologic cancer," "melanoma," "questionnaire," "symptom assessments," and related variants. Additionally, reference lists of retrieved articles were manually searched for relevant studies within the specified time frame.

Eligibility criteria
Studies were eligible for inclusion if they provided information on the usage of the LBCQ, GCLQ, and/or MELQ, were

primary research, and were published in English between 1998 and 2018. Articles that did not focus on the utilisation of these lymphoedema symptom tools in the context of lymphoedema were excluded.

Data extraction and synthesis
The search results were screened, and potentially eligible studies were identified based on title and abstract review. Duplicate entries were removed, and full-text articles were obtained for studies that provisionally met the inclusion criteria. The data extraction and synthesis process followed the PRISMA guidelines. Full-text articles were thoroughly reviewed, and relevant information, including study purpose, sample characteristics, findings, and disciplines, were extracted and organised into a literature matrix (*Table 1*).

Results
The search yielded a total of 210 results across the databases, including CINAHL, PubMed, Scopus, Google Scholar, PsychINFO, and Cancer Net. After screening and removing duplicates, 91 full-text articles were reviewed, while two studies were identified from the reference lists of included articles. A total of 31 studies were included in the final synthesis (*Table 1*).

Study characteristics
Country of adoption
The majority of studies (*n*=26, 83.87%) reported the use of the LBCQ, GCLQ, or MELQ in the US. Other countries represented included the UK (*n*=2), South Korea (*n*=2), and South Africa (*n*=1)(Bulley et al, 2014, 2013; Choi et al, 2015; Lee et al, 2018; Khutjwe, 2018). The GCLQ-K was adapted for the Korean culture and population, while the GCLQ-7 is a concise, 7-item version of the GCLQ-K, maintaining comparable discriminative ability to the original questionnaire (Lim et al, 2014; Kim et al, 2017).

Sample characteristics
Sample sizes ranged from 1 to 936 participants. Most participants were Caucasian, with reported mean ages ranging from 49.9 to 63.6 years. The study populations included breast cancer survivors with and without lymphoedema, patients with gynaecological cancers (uterine, endometrial, cervical, and vulvar),

Table 1. Study characteristics			
Author/ year	Study Design/purpose	Sample Characteristics Country/region/settings	Researcher Discipline(s)/ affiliations
Lymphedema Breast Cancer Questionnaire			
Armer et al, 2003	Descriptive, comparative, cross-sectional To assess the Lymphedema Breast Cancer Questionnaire's accuracy in detecting lymphoedema through self-reported symptoms	USA/Midwestern University-affiliated cancer centre n=183 (two samples: 80 (40 post-BC women with lymphoedema and 40 healthy women with no history of BC or lymphoedema) + 103 BC survivors) Mean age: 50.2 years	Nursing; Family studies, design, family and consumer sciences; Oncology; Researcher
Armer et al, 2004	Descriptive, comparative, cross-sectional To compare lymphoedema occurrence, signs, and symptoms among BC patients who underwent ALND, SLNB, both, or neither	USA/Midwestern Cancer centre n=100 women treated for BC and receiving follow-up care Mean age: 58.7 (31–88) years	Nursing; Oncology
Armer & Fu, 2005	Descriptive, exploratory, cross-sectional To explore age differences in post-BC lymphoedema occurrence and symptoms	USA/Midwestern Cancer centre n=100 women treated and followed for BC Mean age: 58.7	Nursing
Radina et al, 2007	Descriptive, comparative, cross-sectional To assess self-care practices in managing cancer-related lymphoedema among BC survivors	USA/Midwestern University-affiliated state cancer centre n=40 BC survivors with either self-diagnosis or medical diagnosis of upper limb lymphoedema ipsilateral to the breast treated for cancer Mean age: 59 (range: 44–81) years	Family studies; Nursing; Oncology researcher
Ridner et al, 2007	Descriptive, comparative, cross-sectional Study the correlation between circumferential measurements, infrared scanning, bioelectrical impedance, and self-reported arm symptoms in healthy volunteers and BC survivors with lymphoedema	USA Cancer centre n=25 people (14 healthy volunteers and 11 BC survivors with lymphoedema) Mean age: 49.9 years	Nursing; Biostatistics
Armer et al, 2008	Prospective, repeated measures Explore four approaches for diagnosing BC lymphoedema, including self-reporting of symptoms, and proposing a clinical research programme based on the Self-Care Deficit Nursing Theory	USA/Midwestern Academic cancer centre n=143 (of 287) persons newly diagnosed with BC, who consented, were enrolled and assessed at pre-op, post-op, and every 3–6 months until 30 months after diagnosis Mean age: Not available	Nursing; Medical oncology; Public health epidemiology
Fu et al, 2008	Exploratory cross-sectional Explore the impact of providing lymphoedema information on BC survivors' symptoms and risk-reduction behaviours	USA n=136 BC survivors in private settings Mean age: 54 (range: 28–80) years	Nursing; Medicine
McLaughlin et al, 2008	Prospective study Examine patient perceptions of lymphoedema and precautionary behaviours years after axillary surgery	USA/Northeast Research cancer centre n=936 women who underwent SLNB alone or SLNB followed by ALND between 1 June 1999 and 30 May 2003 Mean age: 58 (range: 28–90) years	Breast service; Behavioural science service; Epidemiology and biostatistics
Armer et al, 2009	Prospective, repeated measures Describe lymphoedema occurrence over time among BC survivors using four diagnostic criteria and three measurement techniques	USA/Midwestern University-affiliated state cancer centre n=211 female participants newly-diagnosed with BC Mean age 57 (range: 30–89) years	Nursing; Education; Project development

Cormier et al, 2009	Prospective cohort study Define the incidence, risk factors, symptoms, and quality of life outcomes related to postoperative limb volume changes	USA/Midwestern Cancer centre n=269 women who enrolled over the course of 5 years (2001–2006) contributed at least 12 months of follow-up data and undergoing surgery for BC Mean age: 56 (range: 29–89) years	Nursing oncology; Surgical oncology
Armer and Stewart, 2010	Prospective, repeated measures Describe lymphoedema trends over 12, 30, and 60 months among BC survivors using four diagnostic criteria and three measurement techniques	USA/Midwestern University-affiliated state cancer centre n=236 female participants newly-diagnosed with BC Mean age 57 (range: 30–89) years	Nursing
Fu et al, 2010	Cross-sectional Investigate the impact of BCRL information on BC survivors' cognitive and symptomatic outcomes	USA/New York University Cancer centre n=136 BC survivors who underwent treatment for BC from August 2006 to May 2007 Mean age: 54.3 (range: 28–80) years	Nursing
Fu et al, 2011	Cross-sectional Explore if symptomatic seroma affects lymphoedema symptoms post-BC treatment	USA/New York University Cancer centre n=130 women who completed surgical treatment as well as chemotherapy or radiation or both for BC within prior 3 years Mean age: 54.3 (range: 28–75) years	Nursing; Surgery; Medicine
Ridner et al, 2011	Secondary data analysis Original parent study (prospective longitudinal) Examines the long-term impact of BMI and obesity on developing BC treatment-related lymphoedema	USA/Midwestern Cancer centre *n*=138 newly diagnosed BC survivors who had arm-volume measurements and symptom assessment at pre-treatment baseline and measurements up to 30 months post-surgery in a prospective longitudinal parent study	Nursing; Engineering; Statistics
Bulley et al, 2013	Secondary analysis of a data set from a cross-sectional study Investigate lymphoedema prevalence using three measurement/diagnostic criteria	UK Western general hospital *n*= 410 women attending review appointments at a breast clinic after completing surgery, chemotherapy, and radiotherapy Mean age: 60.99 years	Health science; Breast specialist
Bulley et al, 2014	Cross-sectional Investigate the validity of the Morbidity Screening Tool for screening fatigue, pain, lymphoedema, and arm function post-BC treatment	UK Breast clinic *n*=613 women who had completed treatment (surgery, chemotherapy	Health science; Breast specialist
Smoot et al, 2014	Descriptive, comparative, cross-sectional Evaluate elbow extension range of motion during upper limb neurodynamic testing post-BC treatment	USA National Lymphedema Network website, San Francisco Bay area hospitals, BC or lymphoedema support groups, and BC conferences *n*=145 women over the age of 18 years who had completed active BC treatment at least 6 months Mean age: 56.52 years	Physical therapy; Nursing
Chance-Hetzler et al, 2015	Secondary data analysis Parent longitudinal, prospective surveillance research study Examine the effectiveness of prospective surveillance in post-surgical BC patients	USA/Midwestern Cancer centre *n*=49 patients enrolled in a longitudinal prospective study Mean age: 59 (34–81) years	Lymphoedema research; Nursing; Oncology; Statistics
Choi et al, 2015	Retrospective study Investigate the efficacy of thoracic sympathetic ganglion block in treating BCRL	South Korea *n*=35 patients with BCRL who underwent thoracic sympathetic ganglion block in a tertiary referral centre/teaching hospital Mean age: 55.8 (range: 38–80) years	Medicine

Hulett et al, 2015	Prospective, longitudinal design with repeated measures Explore BC survivors' perspectives from diagnosis to 30 months post-treatment	USA/Midwestern University-affiliated cancer centre n=379 women with newly-diagnosed BC undergoing treatment Mean age: 57.9 (range: 20–92) years	Nursing; Education
Lee et al, 2018	Case report Describe the effects of sympathetic ganglion block on infectious BCRL patients	South Korea Outpatient clinic n=1 woman with right arm oedema and cellulitis who had a right breast modified radical mastectomy with ALND 3 years earlier Mean age: 66 years	Anaesthesiology & pain medicine
Goldberg et al, 2011	Cross-sectional Examine the relationship between SLNB lymph node excision count and patient-perceived lymphoedema	USA Memorial Sloan–Kettering Cancer Center n=600 women who underwent SLNB for BC Median age: 56 (range: 24–83) years	Breast service; Epidemiology & biostatistics; Medicine
Gynecologic Cancer Lymphedema Questionnaire			
Carter et al, 2010	Descriptive, comparative, cross-sectional Determine the feasibility and efficacy of using the Gynecologic Cancer Lymphedema Questionnaire as a symptom scale for lower extremity lymphoedema (quality improvement)	USA Memorial Sloan–Kettering Cancer Center Gynaecology Service n=58 (28 gynaecologic cancer survivors with documented lower extremity lymphoedema and 30 without a history or presence of lymphoedema Mean age: 59.6 (range: 28–80) years	Psychiatry & behavioural sciences; Gynaecology surgery Epidemiology & biostatistics; Nursing
Brown et al, 2013	Cross-sectional Examine the association between physical activity and lower limb lymphoedema in uterine cancer survivors, focusing on walking	USA Abramson Cancer Center at the University of Pennsylvania n=213 patients with uterine cancer Median age: 63.6 (range: 29–94) years	Clinical epidemiology & biostatistics; Female pelvic medicine and reconstructive surgery; Gynaecologic oncology
Brown et al, 2014	Cross-sectional Quantify physical function and its association with physical activity, walking, and lower limb lymphoedema in uterine cancer survivors	USA University of Pennsylvania n=213 patients with uterine cancer Median age: 63.6 (range: 29–94) years	Medicine
Hammer et al, 2014	Cross-sectional Describe physical activity participation, characterise physical and functional impairments, and examine their association with uterine cancer survivors	USA Large university cancer centre n=213 patients with uterine cancer Mean age: 63.5 years	Clinical epidemiology and biostatistics; Female pelvic medicine and reconstructive surgery; Obstetrics and gynaecology; Surgery (urology); Gynaecologic oncology
Zhang et al, 2016	Cross-sectional survey Quantify the relationship between BMI and physical function in endometrial cancer survivors	USA Academic health system (University of Pennsylvania) n=213 endometrial cancer survivors Mean age: 63.6 years	Public health science; Population sciences

Khutjwe, 2018 (Doctoral dissertation)	Cross-sectional survey Describe the incidence of lower limb lymphoedema and its effects on women treated with radiotherapy for gynaecological cancer at an academic hospital	South Africa Johannesburg Academic hospital n=155 women diagnosed with gynaecological cancer and at least 12 months, but not more than 24 months, after completing radiotherapy treatment Mean age: 49.5 (range: 29–80) years	Nursing
Melanoma Lymphedema Questionnaire			
Chang et al, 2010	Prospective study Assess the incidence, risk factors, and costs of wound complications and lymphoedema in melanoma patients undergoing inguinal lymph node dissection	USA University of Texas MD Anderson Cancer Center n=20 melanoma patients undergoing inguinal lymph node dissection	Medicine; Surgical oncology
Hyngstrom et al, 2013	Prospective longitudinal study Prospectively assess limb volume change and symptoms in melanoma patients undergoing SLNB and/or therapeutic lymph node dissection	USA University of Texas MD Anderson Cancer Center n=182 patients with confirmed diagnosis of invasive cutaneous melanoma, stage I–III, without a prior operation on the regional nodal basin at the time of enrolment	Nursing; Surgical oncology
Voss et al, 2015	Prospective, repeated measures Assess cumulative incidence, symptoms, and risk factors for upper-extremity lymphoedema in BC and melanoma patients undergoing SLNB or ALND	USA University of Texas MD Anderson Cancer Center n=349 (205 BC and 144 melanoma patients) Mean age: 59.1 years	Education; Medicine; Nursing; Public health
ALND = axillary lymph node dissection; BC = breast cancer; BCRL = breast cancer-related lymphoedema; SLNB = sentinel lymph node biopsy.			

and patients with melanoma. These populations comprised cancer patients receiving follow-up care, as well as those actively undergoing surgery, chemotherapy, and/or radiotherapy.

Settings
The participants were recruited from diverse settings across the included studies. The majority were recruited from university-affiliated cancer centres (n=14, 45.16%) and academic/university hospitals (n=6, 19.35%). Other recruitment sites were reported as cancer centres (n=3, 9.68%), general hospitals (n=1, 3.23%), breast clinics (n=1, 3.23%), outpatient clinics (n=1, 3.23%), breast centres (n=1, 3.23%), cancer centres and community centres (n=1, 3.23%), and private settings (n=1, 3.23%). One study (3.23%) recruited participants through the National Lymphedema Network website, support groups, and breast cancer conferences. The setting was not reported in one study (3.23%) (Table 1).

Study designs
The included studies employed a variety of research designs: cross-sectional (n=17), prospective (n=9), secondary data analysis (n=3), retrospective (n=1), and a case report (n=1). The cross-sectional design was the most commonly used, followed by prospective studies.

Disciplines of researchers
The lymphoedema symptom assessment tools were utilised by researchers from diverse disciplines, including nursing (n=22), medicine (n=10), education (n=2), surgery (n=5), gynaecologic oncology (n=2), obstetrics and gynaecology (n=2), family studies (n=1), psychiatry and behavioural sciences (n=1), engineering (n=1) and anaesthesiology and pain medicine (n=1). More than half of the studies (n=19) were conducted by multidisciplinary teams, highlighting the collaborative nature of lymphoedema research and the applicability of these tools across various healthcare specialities.

Validity and reliability of lymphoedema assessment tools
Studies have reported that the LBCQ demonstrates high face and content validity and exhibits high reliability, with internal consistency ranging from 0.785 to 0.82 and a test-retest reliability of 0.98 (Armer et al, 2003; Gordon et al, 2009).

The validity and reliability of the LBCQ have been supported by references in 18 articles, as detailed by Armer et al. (2004, 2003). Studies reported good construct and face validity of GCLQ, as well as its high internal consistency reliability (Cronbach's alpha = 0.95) (Carter et al, 2010). Five articles referred to the reliability of the GCLQ, as reported by Carter et al (2010). Evidence regarding the validity and reliability of the MELQ was not identified separately from the LBCQ in the included studies. In a validity study of the Morbidity Screening Tool, Gordon et al (2009) reviewed the validity and reliability of four subjective questionnaires, including the LBCQ, for evaluating breast cancer-related lymphoedema. Both the LBCQ and a telephone questionnaire were found to specifically address the physical symptoms of lymphoedema and effectively discriminate between women with and without breast cancer-related lymphoedema.

In a study comparing various lymphoedema measurement methods, the LBCQ was utilised alongside other tools to assess prevalence. The findings revealed that the LBCQ estimated a prevalence of 23.9%, aligning closely with other methods and

demonstrating its reliability in population-based assessments (Bulley et al, 2013).

Discussion

This review provides a comprehensive overview of the study characteristics involving the LBCQ, GCLQ, and MELQ. It highlights the diverse range of clinical and community settings for participant recruitment, predominantly from university-affiliated cancer centres and academic hospitals, enhancing the generalisability of findings and underscoring the applicability of these questionnaires across various healthcare and community contexts. The review also examines the diverse study designs, ranging from cross-sectional to prospective and secondary data analyses. It emphasises the multidisciplinary nature of the research teams, highlighting the broad relevance and utility of the LBCQ, GCLQ, and MELQ in lymphoedema assessment and management. Additionally, it presents evidence of the strong psychometric properties, validity, and reliability of the LBCQ and GCLQ, while noting the absence of separate validity and reliability data for the MELQ.

Widespread utility and adaptations

The LBCQ, GCLQ, and MELQ have been extensively utilised across various geographical locations, research designs, populations, settings, and disciplines. These tools have demonstrated efficacy in assessing symptoms of upper and lower-extremity lymphoedema in research studies (Carter et al, 2019). The adaptation of GCLQ and MELQ from the initial LBCQ enables the comparison of lymphoedema symptoms across multiple cancer diagnoses. Moreover, the successful adaptation of the GCLQ for use in non-English-speaking countries demonstrates its feasibility and reliability in diverse linguistic contexts, thereby promoting its cross-cultural applicability (Bjerre Trent et al, 2023; Lim et al, 2014). Furthermore, the briefer GCLQ-7 version promotes time-efficient assessments during follow-up evaluations.

Versatility and interdisciplinary collaboration

The use of these lymphoedema assessment tools in various settings, including university-affiliated cancer centres, outpatient clinics, and private settings, demonstrates their versatility and potential to reach a broader population of survivors. Additionally, the utilisation of these tools across different research designs, from case reports to cross-sectional, prospective, and retrospective studies, highlights their applicability in generating diverse levels of evidence. The range of validity and reliability reported for these tools underscores their suitability for assessing lymphoedema in breast cancer, gynaecological cancers, and melanoma. Furthermore, their use across cultures promotes cultural humility in healthcare, which is essential for successful outcomes, while their application across disciplines facilitates interdisciplinary collaboration and team science (Little et al, 2017; Foronda, 2020; Anderson et al, 2022).

Assessing the multidimensional impact on patient well-being

The LBCQ is acknowledged as a valuable instrument for exploring various aspects of lymphoedema beyond mere physical measurements. Studies have demonstrated that subjective tools, such as LBCQ, capture the functional and emotional dimensions of lymphoedema, making it useful for monitoring multiple facets of the patient experience (Bulley et al, 2013). A study comparing objective and subjective measurement tools found that quality of life scores differed significantly between women with and without lymphoedema when using subjective measures, such as LBCQ (Bulley et al, 2013). This suggests that LBCQ can capture important aspects of lymphoedema that impact patients' quality of life (Eaton et al, 2020; Sun et al, 2020).

Limitations and recommendations

While a rigorous systematic search was conducted, it is possible that some studies utilising these tools were overlooked due to inconsistent naming conventions or lack of explicit tool identification in the text. Although these unreported usages may influence practice and research, they were not captured in this review. It is recommended that LBCQ, GCLQ, and MELQ should be utilised in settings managing patients with breast cancer, gynaecological cancer, and melanoma, respectively, to aid in early detection and management of lymphoedema, thereby preventing complications and enhancing the quality of life (Kayıran et al, 2017; Sun et al, 2024). For non-English speakers, prospective users can contact the tool developers for permission to translate and adapt the tools through established processes.

Future studies should incorporate these subjective tools alongside objective measures to accurately assess lymphoedema and its impact on breast cancer survivors (Bulley et al, 2013). Researchers should ensure accurate reporting of research settings and provide clear tool identification to promote awareness and utilisation. Additionally, when adapting these tools to new settings, languages, and populations, psychometric evaluations should be conducted to ensure continued efficacy in supporting better patient care and research outcomes.

By highlighting the widespread utility, psychometric robustness, and versatility of the LBCQ, GCLQ, and MELQ, this discussion emphasises their value as comprehensive lymphoedema assessment tools. Their adaptability across cancer types, settings, and cultures underscores their potential to facilitate early detection, interdisciplinary collaboration, and improved patient outcomes in lymphoedema management (Armer et al, 2016).

Conclusion

Accurate and timely diagnosis of lymphoedema through the use of valid and reliable assessment tools is crucial for establishing effective treatment, especially in the early stages of the condition. The study findings robustly endorse the use of lymphoedema self-reported symptom instruments (LBCQ, GCLQ, MELQ) in research. These tools effectively assess cancer-related lymphoedema in both upper and lower extremities, spanning breast cancer, gynaecologic cancer, and melanoma. Their extensive utilisation in diverse settings, languages, and continents renders these tools invaluable for patients with cancer-related lymphoedema and the clinicians and researchers supporting them.

References

Anderson EA, Anbari AB, Sun Y, Armer JM (2022) A multiple case study of Latina breast cancer survivors returning to work with breast cancer-related lymphedema: adaptation, resilience, and quality of life. *Hisp Health Care Int* 20(4): 222–30

Armer JM, Feldman JL, Ostby PL et al (2018) Lymphedema within the healthcare system. In: Lee BB, Rockson SG, Bergan J (Eds.), *Lymphedema: a concise compendium of theory and practice*. Springer International Publishing, Cham, pp. 503–23

Armer JM, Feldman JL, Ostby PL et al (2016) Simplifying evidence-based management of breast cancer-related lymphedema. *Expert Rev Qual Life Cancer Care* 1(5): 389–402

Armer JM, Fu MR, Wainstock JM et al (2004) Lymphedema following breast cancer treatment, including sentinel lymph node biopsy. *Lymphology* 37(2): 73–91

Armer J, Fu MR (2005) Age differences in post–breast cancer lymphedema signs and symptoms. *Cancer Nursing* 28: 200-207.

Armer JM, Henggeler MH, Brooks CW, et al (2008). The health deviation of post-breast cancer lymphedema: Symptom assessment and impact on self-care agency. *Self Care Depend Care Nurs* 16(1): 14–21

Armer JM, Radina ME, Porock D, Culbertson SD (2003) Predicting breast cancer-related lymphedema using self-reported symptoms. *Nurs Res* 52(6): 370–379

Armer JM, Stewart BR (2010). Post-breast cancer lymphedema: incidence increases from 12 to 30 to 60 months. *Lymphology* 43(3): 118–27

Armer JM, Stewart BR, Shook RP (2009) 30-month post-breast cancer treatment lymphoedema. *J Lymphoedema* 4(1): 14–18

Bjerre Trent P, Falk RS, Staff AC, et al (2023) Translation and cross-cultural adaptation of the Gynecologic Cancer Lymphedema Questionnaire and the Lower Extremity Lymphedema Screening Questionnaire. *Int J Gynecol Cancer* 33(2): 231–235

Brown JC, John GM, Segal S, et al (2013) Physical activity and lower limb lymphedema among uterine cancer survivors. *Med Sci Sports Exerc* 45(11): 2091–2097

Brown JC, Lin LL, Segal S et al (2014) Physical activity, daily walking, and lower limb lymphedema associate with physical function among uterine cancer survivors. *Support Care Cancer* 22(11): 3017–3025.

Bulley C, Coutts F, Blyth C, et al (2014) A morbidity screening tool for identifying fatigue, pain, upper limb dysfunction and lymphedema after breast cancer treatment: a validity study. *Eur J Oncol Nurs* 18(2): 218–227

Bulley C, Gaal S, Coutts F et al (2013) Comparison of breast cancer-related lymphedema (upper limb swelling) prevalence estimated using objective and subjective criteria and relationship with quality of life. *BioMed Res Int* 2013(2013): 807569

Burian EA, Franks PJ, Borman P et al (2024) Factors associated with cellulitis in lymphedema of the arm – an international cross-sectional study (LIMPRINT). *BMC Infect Dis* 24(1): 102

Carter J, Huang HQ, Armer J et al (2019) GOG 244 - The LymphEdema and Gynecologic cancer (LEG) study: The association between the gynecologic cancer lymphedema questionnaire (GCLQ) and lymphedema of the lower extremity (LLE). *Gynecol Oncol* 155(3): 452–460

Carter J, Raviv L, Appollo K et al (2010) A pilot study using the Gynecologic Cancer Lymphedema Questionnaire (GCLQ) as a clinical care tool to identify lower extremity lymphedema in gynecologic cancer survivors. *Gynecol Oncol* 117(2): 317–323

Chance-Hetzler J, Armer J, Van Loo M et al (2015) Prospective lymphedema surveillance in a clinic setting. *J Pers Med* 5(3): 311–325

Chang SB, Askew RL, Xing Y et al (2010) Prospective assessment of postoperative complications and associated costs following inguinal lymph node dissection (ILND) in melanoma patients. *Ann Surg Oncol* 17(10): 2764–2772

Chaput G, Ibrahim M (2023) Cancer-related lymphedema. *Can Fam Physician* 69(10): 691–695

Choi E, Nahm FS, Lee PB (2015) Sympathetic block as a new treatment for lymphedema. *Pain Physician* 18(4): 365–372

Cormier JN, Askew RL, Mungovan KS et al (2010) Lymphedema beyond breast cancer: A systematic review and meta-analysis of cancer-related secondary lymphedema. *Cancer* 116(22): 5138–49

Cormier JN, Xing Y, Zaniletti I et al (2009) Minimal limb volume change has a significant impact on breast cancer survivors. *Lymphology* 42(4): 161–175

Deban M, Vallance P, Jost E (2022) Higher rate of lymphedema with inguinal versus axillary complete lymph node dissection for melanoma: a potential target for immediate lymphatic reconstruction? *Curr Oncol* 29(8): 5655–5663

Eaton LH, Narkthong N, Hulett JM (2020) Psychosocial issues associated with breast cancer-related lymphedema: a literature review. *Curr Breast Cancer Rep* 12(4): 216–224

Executive Committee of the International Society of Lymphology (2020) The diagnosis and treatment of peripheral lymphedema: 2020 Consensus Document of the International Society of Lymphology. *Lymphology* 53(1): 3–19

Foronda C (2020) A theory of cultural humility. *J Transcult Nurs* 31(1): 7–12

Fu MR, Axelrod D, Haber J (2008) Breast-cancer-related lymphedema: Information, symptoms, and risk-reduction behaviors. *J Nurs Scholarsh* 40(4): 341–348

Fu MR, Chen CM, Haber J (2010) The effect of providing information about lymphedema on the cognitive and symptom outcomes of breast cancer survivors. *Ann Surg Oncol* 17(7): 1847–1853

Fu MR, Guth AA, Cleland CM (2011) The effects of symptomatic seroma on lymphedema symptoms following breast cancer treatment. *Lymphology* 44(3): 134–143

Gençay Can A, Ekşioğlu E, Çakçı FA (2019) Early detection and treatment of subclinical lymphedema in patients with breast cancer. *Lymphat Res Biol* 17(3): 368–373

Goldberg JI, Riedel ER, Morrow M, Van Zee KJ (2011) Morbidity of sentinel node biopsy: relationship between number of excised lymph nodes and patient perceptions of lymphedema. *Ann Surg Oncol* 18(10): 2866

Gordon S, Sheppard L, Selby A (2009) BCRL questionnaires: climate and indigenous groups. *J Lymphoedema* 4(2): 44–51

Hammer SM, Brown JC, Segal S (2014) Cancer-related impairments influence physical activity in uterine cancer survivors. *Med Sci Sports Exerc* 46(12): 2195–2201

Hayes SC, Janda M, Ward LC (2017) Lymphedema following gynecological cancer: results from a prospective, longitudinal cohort study on prevalence, incidence and risk factors. *Gynecol Oncol* 146(3): 623–629

Hidding JT, Viehoff PB, Beurskens CH et al (2016) Measurement properties of instruments for measuring of lymphedema: systematic review. *Phys Ther* 96(12): 1965–1981

Hulett J, Armer J, Stewart B, Wanchai A (2015) Perspectives of the breast cancer survivorship continuum: Diagnosis through 30 months post-treatment. *J Pers Med* 5(2): 174–190

Hyngstrom JR, Chiang YJ, Cromwell KD et al (2013) Prospective assessment of lymphedema incidence and lymphedema-associated symptoms following lymph node surgery for melanoma. *Melanoma Res* 23(4): 290–297

Kayıran O, De La Cruz C, Tane K, Soran A (2017) Lymphedema: From diagnosis to treatment. *Turk J Surg* 33(2): 51–57

Khutjwe JV (2018) The incidence and effects of lower limb lymphoedema in women treated with radiotherapy for gynaecological cancer in an academic hospital in Johannesburg. Univerity of Witwatersrand, Johannesbuurg. https://wiredspace.wits.ac.za/items/a867dc59-326c-4e9f-b0dc-be18e2d75723

Kim SI, Kim N, Lee S et al (2017) Development of the short version of the Gynecologic Cancer Lymphedema Questionnaire: GCLQ-7. *J Gynecol Oncol* 28(2): 203–210

Koelmeyer L, Gaitatzis K, Ridner SH et al (2021) Implementing a prospective surveillance and early intervention model of care for breast cancer-related lymphedema into clinical practice: application of the RE-AIM framework. *Support Care Cancer* 29(2): 1081–1089

Lee YY, Park HS, Lee YS et al (2018) The effect of stellate ganglion block on breast cancer-related infectious lymphedema. *Korean J Hosp Palliat Care* 21(4): 158–162.

Lim MC, Lee JS, Joo J et al (2014) Development and evaluation of the Korean version of the Gynecologic Cancer Lymphedema Questionnaire in gynecologic cancer survivors. *Gynecol Oncol* 133(1): 111–116

Little MM, St Hill CA, Ware KB et al (2017) Team science as interprofessional collaborative research practice: a systematic review of the science of team science literature. *J Investig Med* 65(1): 15–22

Lockwood S. Unpublished data on Gynecological Cancer Lymphedema Questionnaire. Texas Christian University.

McLaughlin SA, Wright MJ, Morris KT et al (2008) Prevalence of lymphedema in women with breast cancer 5 years after sentinel lymph node biopsy or axillary dissection: patient perceptions and precautionary behaviors. *J Clin Oncol* 26(32): 5220–5226

Pereira ACPR, Koifman RJ, Bergmann A (2017) Incidence and risk factors of lymphedema after breast cancer treatment: 10 years of follow-up. *Breast* 36: 67–73

Radina E, Armer J, Daunt D et al (2007) Self-reported management of breast cancer-related lymphoedema. *J Lymphoedema* 2(2): 12–21

Ridner SH, Dietrich MS, Stewart BR, Armer JM (2011) Body mass index and breast cancer treatment-related lymphedema. *Support Care Cancer* 19(6): 853–857

Ridner SH, Montgomery LD, Hepworth JT et al (2007) Comparison of upper limb volume measurement techniques and arm symptoms between healthy volunteers and individuals with known lymphedema. *Lymphology* 40(1): 35–46

Smoot B, Boyd BS, Byl N, Dodd M (2014) Mechanosensitivity in the upper extremity following breast cancer treatment. *J Hand Ther* 27(1): 4–11

Sun Y, Armer JM (2019) A nurse's twenty-four-year journey with breast cancer-related lymphedema. *Work* 63(1): 21–31

Sun Y, Fu MR, Jiang Y, Little AS (2024) Initiating and maintaining complete decongestive therapy self-management of lymphedema among breast cancer survivors: descriptive qualitative study. *Integr Cancer Ther* 23: 15347354241226625

Sun Y, Shigaki CL, Armer JM (2020) Return-to-work and breast cancer survivorship care. *Curr Breast Cancer Rep* 12: 202–207

Sun Y, Shigaki CL, Armer JM (2020) The influence of breast cancer related lymphedema on women's return-to-work. *Womens Health (Lond)* 16: 1745506520905720

Tidhar D, Armer JM, Anbari AB et al (2022). Clinical Evaluation of Lymphedema. In: Cheng M-H, Chang DW, Patel KM (Eds.), *Principles and Practice of Lymphedema Surgery*. Elsevier, pp. 68–77

Voss RK, Cromwell KD, Chiang YJ et al (2015) The long-term risk of upper-extremity lymphedema is two-fold higher in breast cancer patients than in melanoma patients. *J Surg Oncol* 112(8): 834–840

Zhang X, Brown JC, Schmitz KH (2016) Association between body mass index and physical function among endometrial cancer survivors. *PLoS One* 11(8): e0160954