



A SYSTEMATIC REVIEW OF NURSING INTERVENTION STUDIES FOR LYMPHEDEMA AFTER BREAST CANCER

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Abstract: This systematic review aims to evaluate the effectiveness of nursing interventions in managing lymphedema after breast cancer treatment and their impact on clinical outcomes. Randomized controlled trials (RCTs) published between 2014 and 2024, examining nursing interventions for lymphedema after breast cancer treatment, were included. A search was conducted in PubMed, ScienceDirect, Scopus, Web of Science, Wiley, DergiPark, Turkish National Thesis Center, and Google Scholar using relevant keywords. A total of 402 studies were screened. Exclusion criteria included studies that did not involve nursing interventions (n=126), were non-interventional (n=7), were not RCTs (n=48), were unrelated to lymphedema (n=39) or breast cancer (n=32), were published outside the 2014–2024 period (n=27), were systematic reviews (n=67), research protocols (n=8), or conference abstracts/book chapters (n=9). Eighteen RCTs met the inclusion criteria. Nursing interventions were categorized into 11 types: educational programs (theory-based, web/mobile), exercise, complex decongestive therapy, bandaging, compression garments, kinesio therapy, simple lymphatic drainage, myofascial release, laser therapy, negative pressure massage, and intermittent pneumatic compression. Intervention groups showed improvements in quality of life, self-care, and upper extremity function, along with reduced arm volume and lymphedema-related symptoms. Overall, interventions yielded positive outcomes. Further research is needed to assess long-term effects.

Keywords: Nursing, Lymphedema, Breast cancer

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1. Introduction

Breast cancer is the most common type of cancer among women worldwide, with 2.3 million women diagnosed and 670.000 deaths reported globally in 2022 (WHO, 2022). One in five women undergoing breast cancer treatment develops lymphedema as a complication (Gillespie et al., 2018; DiSipio et al., 2013). Lymphedema occurs due to impaired lymphatic drainage, often resulting from axillary lymph node dissection, radiotherapy, fibrosis, or inflammation following breast cancer surgery. This impairment leads to the abnormal accumulation of protein-rich fluid in the interstitial space (Dönmez and Kapucu, 2017). The incidence of unilateral arm lymphedema after breast cancer treatment has been reported to range from 8.4% to 21.4% (DiSipio et al., 2013). Lymphedema symptoms vary depending on the severity of fluid retention and are characterized by swelling, a sensation of heaviness, tightness, pain, and functional impairment in the affected limb (Chowdhry et al., 2016; Armer et al., 2003). These symptoms hinder daily activities and negatively affect fine and gross motor skills. Consequently, individuals experience functional limitations in work, household chores, personal care, and social interactions (DiSipio et al., 2013). Lymphedema

significantly impacts the quality of life, leading to physical and psychological challenges (Dönmez and Kapucu, 2017). Physically, patients may experience pain in the hand, arm, and shoulder, restricted joint mobility, and a sense of heaviness and fullness in the upper extremity. Psychologically, they may face body image disturbances, anxiety, anger, embarrassment, and social isolation (Fu et al., 2013).

Early preventive measures and appropriate interventions can significantly reduce the risk of lymphedema development or help maintain control over the condition (Temur and Kapucu, 2018). Nurses play a critical role in preventing, managing, and monitoring lymphedema by encouraging patients to take responsibility for their care (Dönmez and Özdemir, 2016). Recommended strategies for lymphedema prevention, symptom management, and treatment include assessing high-risk patients, developing educational programs that incorporate prevention strategies, increasing patient awareness of risk factors, and teaching self-care practices to promote active participation in the treatment process (Szuba et al., 2002; O'Toole et al., 2013; Temur and Kapucu, 2018). Additionally, lymphedema management includes various therapeutic approaches such as skin care, limb elevation,



massage, physical activity, manual lymphatic drainage, pneumatic pumps, laser therapy, compression garments, and both medical and surgical treatments (Dönmez and Özdemir, 2016).

Nurses play a key role in preventing and managing lymphedema (Gül and Erdim, 2009). By assessing factors such as patients' ideal weight, limb measurements, capacity to perform daily activities, surgical history, existing comorbidities, and history of radiotherapy, nurses can identify the risk of lymphedema development at an early stage (Akkaş Gürsoy et al., 2010). Additionally, nurses are responsible for determining the needs of lymphedema patients throughout the care process, from admission to discharge, and implementing appropriate nursing interventions. Supporting patients in maintaining self-care skills during treatment is crucial. Early detection of potential complications is critical in preventing lymphedema progression, and referring patients to specialists when necessary enhances treatment effectiveness (Lasinski, 2013). In this context, this study aims to evaluate the effectiveness of nursing-based interventions in lymphedema management after breast cancer to improve patient care and promote the widespread adoption of evidence-based practices in lymphedema management.

To achieve this objective, a systematic review was conducted of randomized controlled trials published between 2014 and 2024 that investigated the effectiveness of nursing interventions for lymphedema management after breast cancer. The study evaluates the impact of nursing interventions on patient outcomes. Additionally, the effectiveness of methods used in lymphedema treatment and the role of nurses in this process were identified to develop recommendations for clinical practice.

2. Review

2.1. Research Model

This is a systematic review. The PRISMA checklist was used for the systematic review (Page et al., 2021).

Research Questions

- What are the nursing interventions used in the management of lymphedema following breast cancer treatment?
- Is there an effect of nursing interventions on the management of lymphedema after breast cancer treatment?
- How do nursing interventions apply in randomized controlled trials conducted between 2014 and 2024, and impact patient outcomes in the management of lymphedema after breast cancer?

2.2. Literature Search Strategy

In the systematic review, publications evaluating the effectiveness of nursing interventions in managing breast cancer-related lymphedema were reviewed. Searches were conducted in PubMed, ScienceDirect, Scopus, Web of Science, and Wiley databases using the keywords "oncology," "breast cancer," "lymphedema," "nursing,"

and "randomized controlled trial." Additionally, searches were performed in DergiPark, Turkish National Thesis Center of the Council of Higher Education, and Google Scholar using the Turkish equivalents of these keywords: "oncology", "breast cancer," "lymphedema," "nursing," and "randomized controlled trial." Studies published between 2014 and 2024 that addressed breast cancer-related lymphedema were accessible in full text, and included nursing interventions were included in the systematic review. The search was conducted between July 15 and August 15, 2024.

2.3. Study Selection and Identification

In this systematic review, two independent researchers screened studies, and the results were compared to ensure consistency. As a result of the literature search, a total of 402 studies were evaluated. Studies were excluded if they did not include nursing interventions (n=126), were not intervention studies (n=7), were not randomized controlled trials (n=48), were unrelated to lymphedema (n=39), were not published between 2013 and 2024 (n=27), were not focused on breast cancer (n=32), were systematic reviews (n=67), were research protocols (n=8), or were conference abstracts or book chapters (n=9). Eighteen studies that met the inclusion criteria were analyzed (Figure 1).

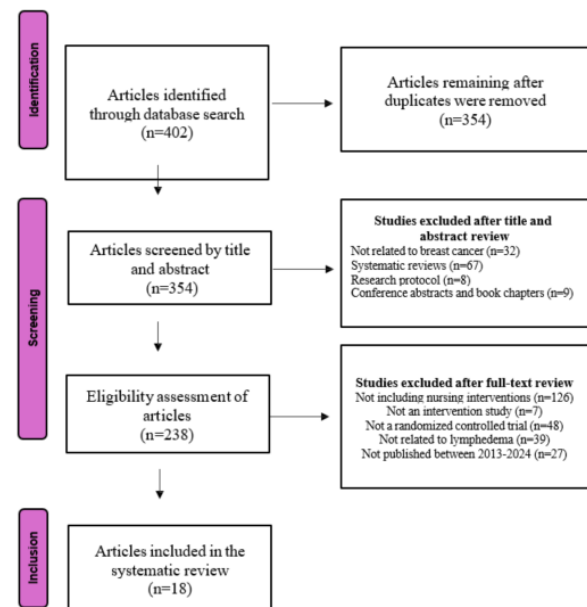


Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Flow Diagram (Page et al., 2021).

2.4. Inclusion Criteria

The systematic review included studies published in English and Turkish literature, which are randomized controlled trials containing a nursing intervention for lymphedema following breast cancer, published between 2014 and 2024, and accessible in full text.

2.5. Exclusion Criteria

Studies focusing on cancers other than breast cancer, systematic reviews, research protocols, conference

abstracts, book chapters, and studies unrelated to lymphedema were excluded from the review.

2.6. Data Collection Tools and Processes

The researchers developed a data extraction tool to collect the research data. This tool allowed for examining data such as author information, publication year, sample size, study design, applied interventions, and control group characteristics of the studies included in the

systematic review. The first researcher independently conducted the data collection process, which was verified by the second researcher for validation purposes.

In the data analysis process, a standardized data summary form was created and presented in table format (Table 1). The table was organized to include information such as the year, authors, study type, sample size, and key findings.

Table 1. Citation information for randomized controlled trials examining the effectiveness of nursing interventions in the management of lymphedema after breast cancer

Author	Year	Country	Sample	Control Group	Intervention Group	Findings
Shi et al.	2023	China	108 patients (n=56 control, n=52 intervention)	Standard care	Lymphedema prevention program based on the information-attitude- practice theory	The intervention group showed less deterioration in grip strength, significant improvement in upper extremity dysfunction and quality of life; no statistically significant difference was found in lymphedema incidence.
			30 patients (n=15 control, n=15 intervention)		Myofascial release + Complex decongestive therapy	Myofascial release improved pain, shoulder range of motion, chest mobility, and shoulder function, and reduced arm volume.
Lin et al.	2022	China	200 patients (n=50 control, n=50 G1, n=50 G2, n=50 G3 intervention groups)	Joint range of motion exercises	G1: Range of motion exercises + Intensive Monitoring G2: Range of motion exercises + Aerobic Exercise + Intensive Monitoring G3: Range of motion exercises + Progressive Resistance Exercise + Intensive Monitoring	In group G3, the best improvement in quality of life and prevention of lymphedema development were observed; in group G2, the best early-stage results in pain control were achieved. Intensive monitoring was found to be effective in increasing exercise motivation.
			43 patients (n=21 control, n=22 intervention)	Kinesio taping Intervention was applied in the group receiving Complex Decongestive Therapy + Intermittent Pneumatic Compression.	In the kinesio taping group, participants received Complex Decongestive Therapy + Intermittent Pneumatic Compression.	Complex Decongestive Therapy and Intermittent Pneumatic Compression resulted in a greater reduction in arm volume and more improvement in shoulder range of motion compared to kinesio taping. In contrast, kinesio taping was found to be more effective in reducing pain and improving patient satisfaction.

Table 1. Citation information for randomized controlled trials examining the effectiveness of nursing interventions in the management of lymphedema after breast cancer (continuing)

Author	Year	Country	Sample	Control Group	Intervention Group	Findings
Deveci	2022	Türkiye	210 patients (n=35 control, n=37 intervention)	Both the intervention and control groups received online standard lymphedema education.	In addition, the intervention group was provided with the Mobile Lymphedema Self-Care Support Program (m-LODEP), which was installed on their phones, and its usage was demonstrated. Data were collected via phone before the intervention, at the first month, and at the third month.	In the experimental group, the Mobile Lymphedema Self-Care Support Program (m-LODEP) led to an increase in self-care scores, improvement in quality of life, reduction in symptoms, and a decrease in arm circumference. In the control group, symptoms decreased and arm measurements were reduced.
Bozdemir and Aygin	2021	Türkiye	60 patients (n=30 control, n=30 intervention)	Standard care	They received training based on the model of activities of daily living.	In the intervention group, significant improvement was observed in upper arm circumference, the Subjective Perception of Postoperative Functional Arm Disability (SPOFIA), and the Disabilities of the Arm, Shoulder, and Hand (DASH) scores compared to the control group.
Lampinen et al.	2021	USA	28 patients (n=13 control, n=15 intervention)	Manual lymphatic drainage	Negative Pressure Massage Therapy	Negative Pressure Massage Therapy has led to improvements in L-Dex (Lymphedema Index) scores and volume differences between extremities compared to manual lymphatic drainage.
Omidi et al.	2020	Iran	105 patients (randomiz ed in 3 blocks with 35 patients in each group)	Standard care	The group-based education and social network-based education were administered.	Group-based and social network-based educations resulted in improvements in quality of life, but were not effective in reducing the fear of cancer recurrence.

Table 1. Citation information for randomized controlled trials examining the effectiveness of nursing interventions in the management of lymphedema after breast cancer (continuing)

Author	Year	Country	Sample	Control Group	Intervention Group	Findings
Cal	2020	Türkiye	72 patients (n=35 control, n=37 intervention)	Standard care	Nursing interventions based on the Health Belief Model	Nursing interventions based on the Health Belief Model resulted in positive changes in lymphedema prevention behaviors, improvement in upper extremity functions, reduction in side effects, increased quality of life, development in self-efficacy, and a decrease in the frequency of lymphedema.
Torres-Lacomba et al.	2020	Spain	150 patients (30 patients in each group, 5 groups)	All participants followed the same treatment process, with only different bandaging/taping methods applied.	Five groups: Multilayer bandaging, simplified multilayer bandaging, cohesive bandaging, adhesive bandaging, kinesiio taping.	Simplified multilayer bandaging and cohesive bandaging showed the most effective results. Kinesiio taping and adhesive bandaging were found to be less effective. A reduction in symptoms was observed in all groups after treatment; however, no significant difference was found between the groups. Kinesiio taping was perceived as the most comfortable, while multilayer bandaging was considered the most uncomfortable.
Ridner et al.	2020	USA	160 patients (n=80 control, n=80 intervention)	Brochure (approximately 2 hours)	Web-based multimedia modules (12 modules, each 30 minutes).	The web-based multimedia modules group showed improvement in biobehavioral symptoms (e.g., mood). However, no significant differences were found between the groups in terms of symptom burden, psychological well-being, function, costs, and arm volume.
Kilmartin et al.	2019	USA	22 patients (n=11 control, n=11 intervention)	Complex Decongestive Therapy + Inactive Laser	Complex Decongestive Therapy + Active Low-Level Laser Therapy	In the intervention group, improvements were reported in symptoms and lymphedema symptom distress, while no significant difference was observed in arm volume.
Pajero et al.	2019	Spain	30 patients (n=15 control, n=15 intervention)	Compression garments (for 4 weeks)	Kinesiio taping (for 4 weeks)	Kinesiio taping reduced lymphedema volume more than compression garments, increased upper extremity range of motion, alleviated symptoms more effectively, and was perceived as more comfortable by the patients.
Temur and Kapucu.	2019	Türkiye	61 patients (n=31 control, n=30 intervention)	The group that did not receive education.	The group that received lymphedema management program education.	No lymphedema development was observed in the intervention group, while 61.2% of the control group developed lymphedema. The intervention group had a higher quality of life and significantly lower symptom scores compared to the control group.
Arinaga et al.	2019	Japan	43 patients (n=21 control, n=22 intervention)	The group receiving traditional treatment.	The group applying the holistic self-care program.	Significant improvements were observed in the intervention group in parameters such as edema, volume changes, transepidermal water loss, mental health, BCRL symptoms, exercise frequency, self-care duration, and satisfaction.

Table 1. Citation information for randomized controlled trials examining the effectiveness of nursing interventions in the management of lymphedema after breast cancer (continuing)

Author	Year	Country	Sample	Control Group	Intervention Group	Findings
Ammitzbøl et al.	2019	USA	130 patients (n=68 control, n=62 intervention)	The group receiving traditional treatment.	The group that received supervised group exercise three times a week for 20 weeks, followed by self-administered resistance exercise for the subsequent 30 weeks.	No significant difference was found in arm volume and lymphedema development in the intervention group, and the exercise program did not have any negative effects.
Arıkan Donmez	2016	Türkiye	52 patients (n=27 control, n=25 intervention)	The group receiving routine care procedures.	The group that performed light exercises, aerobic exercises, stretching exercises, and simple lymphatic drainage massage.	No lymphedema development was observed in the intervention group, while 59.3% of the control group developed lymphedema. At week 6, a significant increase in arm circumference was observed in the control group. In the intervention group, pain, limitations in activities of daily living, heaviness, tightness, and numbness sensation decreased.
Pekyavaş et al.	2014	Türkiye	45 patients (randomized into 3 groups)	Complex Decongestive Therapy	Group 1 : Bandaged Complex Decongestive Therapy, Group 2 : Complex Decongestive Therapy with Bandaging + Kinesio Taping, Group 3: Complex Decongestive Therapy with Kinesio Taping without Bandaging	Kinesio taping and complex decongestive therapy significantly reduced edema after treatment. The application of kinesio taping alone also resulted in a reduction in edema. Symptoms decreased in all groups, but complex decongestive therapy was effective in reducing arm volume only during the treatment period.

3. Results

In this systematic review, 18 randomized controlled trials published between 2014 and 2024 that met the inclusion criteria were analyzed, and the findings are summarized in Table 1. The studies' results showed that nursing interventions have significant effects on the management of lymphedema after breast cancer.

Among the interventions used in lymphedema management, methods such as exercise programs, education based on the information-attitude-practice

theory, kinesiology therapy, manual lymphatic drainage, compression garments, and negative pressure massage were prominent. The findings indicate that these interventions improve patients' quality of life, enhance upper extremity functions, and reduce lymphedema-related symptoms (Shi et al., 2023; Lin et al., 2022).

It has been determined that exercise programs, particularly aerobic exercises and range-of-motion exercises, improve upper extremity functions and contribute to the prevention of lymphedema (Lin et al.,

2022; Çal, 2020; Arinaga et al., 2019; Arıkan Dönmez, 2016). Kinesiology therapy applications have been reported to be effective in reducing arm volume and alleviating symptoms, and they are also found to be more comfortable for patients (Pajero et al., 2019; Torres-Lacomba et al., 2020; Pekyavaş et al., 2014). Cognitive-behavioral educational interventions have improved patients' self-care behaviors but did not create a statistically significant difference in the development of lymphedema (Shi et al., 2023). Although web-based multimedia modules improved biopsychosocial symptoms, they did not significantly affect symptom burden, psychological well-being, function, costs, and arm volume (Ridner et al., 2020). Compression garments and bandages (Torres-Lacomba et al., 2020; Temur and Kapucu, 2019), as well as multilayer bandaging, are effective in the treatment of lymphedema, but they were less comfortable compared to kinesiology therapy.

The 18 randomized controlled trials included in this systematic review classified nursing interventions for lymphedema management into 11 categories. The interventions examined include theory-based lymphedema prevention programs, web-based and mobile education programs, exercise programs, intermittent pneumatic compression, negative pressure massage, bandaging and compression garments, simple lymphatic drainage, complex decongestive therapy, myofascial relaxation, laser therapy, and education.

Theory-based programs are grounded in approaches such as the Health Belief Model and activities of daily living. In contrast, web-based and mobile education programs contain multimedia modules and social network-based content. Exercise programs include resistance, aerobic, and stretching exercises; complex decongestive therapy, simple lymphatic drainage, intermittent pneumatic compression, compression garments, and negative pressure massage are considered interventions to improve the physical symptoms of lymphedema. Educational interventions include brochures, web-based programs, and education based on holistic self-care programs. The distribution of interventions by type is summarized in Table 2.

Table 2. Distribution of studies by type of intervention applied

Intervention Type	n	%
Theory-Based Lymphedema Prevention Programs	3	11.5
Web-Based and Mobile Education Programs	3	11.5
Exercise Programs	3	11.5
Intermittent Pneumatic Compression	1	3.8
Negative Pressure Massage	1	3.8
Bandaging, Compression Garments, and Kinesiology Therapy	4	15.4
Simple Lymphatic Drainage	2	7.7
Complex Decongestive Therapy	4	15.4
Myofascial Relaxation	1	3.8
Laser Therapy	1	3.8
Education	3	11.5
Total	26	100

n has been expanded.

4. Discussion

Lymphedema following breast cancer is a chronic complication that negatively impacts patients' physical functionality, quality of life, and psychosocial well-being. This condition, which is challenging to treat and manage, leads to limitations in daily activities, affecting individuals' independence and social life (Donahue et al., 2023). Effective lymphedema management requires a multidisciplinary approach, with nurses playing a critical role in this process (Fu et al., 2005). This systematic review aims to determine the effectiveness of nursing interventions in the management of lymphedema following breast cancer and to identify the most effective practices. The findings suggest that nursing interventions positively impact patients' physical and psychosocial health.

Exercise-based interventions are among the commonly used methods for preventing and treating lymphedema. Studies have shown that resistance and aerobic exercises, in particular, improve upper extremity functions, reduce symptoms such as pain and swelling, and enhance overall quality of life (Lin et al., 2022; Ammitzbøll et al., 2019). A study conducted by Arıkan Dönmez (2016) reported that light aerobic exercises and stretching movements help prevent the development of lymphedema and enable patients to perform daily living activities more comfortably.

Physiological mechanisms also support the effectiveness of exercise in lymphedema management. The literature indicates that aerobic exercises increase the release of β -endorphins from the pituitary gland, which produces analgesic and anti-inflammatory effects (Grossman and Sutton, 1985; Shrihari, 2019). Additionally, the increased activity of the muscle pump during exercise may accelerate lymphatic circulation and reduce edema (Nelson, 2016). Personalized exercise programs should be developed to ensure the effectiveness of exercise

interventions. Furthermore, exercise programs should be tailored to the patient's individual needs and, ideally, administered under the guidance of a lymphedema specialist with experience working with patients who have lymphedema or are at risk for its development (Arikan Dönmez and Kapucu, 2017). Regular follow-up and motivation are also considered necessary to maintain the long-term effectiveness of the exercises.

In the studies examined in this review, it has been observed that kinesio tape applications are effective in reducing arm volume and alleviating symptoms and are perceived as a more comfortable intervention by patients (Pajero et al., 2019; Torres-Lacomba et al., 2020; Pekyavaş et al., 2014). Kinesio therapy has been reported to increase lymph flow by providing elastic support to the skin, which can help reduce edema (Vergili and Oktas, 2015). However, compression garments and bandaging applications also play an important role in lymphedema management (Borman, 2016). A study by Lacomba et al. (2020) found that multilayer bandages were effective in treating lymphedema but were less preferred than Kinesio tape regarding patient comfort. Similarly, a study by Pekyavaş et al. (2014) found that kinesio tape effectively reduced lymphedema volume when combined with complex decongestive therapy. These findings emphasize the importance of nurses customizing treatment plans by considering each patient's characteristics and needs. The effectiveness of different physical interventions in lymphedema treatment may vary depending on factors such as the patient's clinical condition, lifestyle, and response to treatment. Therefore, nurses should develop personalized treatment approaches tailored to the patient's needs, ensuring that the treatment process is more effective and sustainable while addressing the patient's holistic nursing care needs. The findings of this study suggest that nurses should create individualized treatment plans for patients and that different physical interventions should be personalized according to patients' requirements.

In addition to physical interventions, patient education and psychosocial support programs play a crucial role in managing lymphedema. Education-based interventions help improve patients' self-care skills, preventing the progression of lymphedema and encouraging active participation in the treatment process (Shi et al., 2023; Temur and Kapucu, 2019). The studies reviewed in this article show that information-attitude-behavior-based education increases patients' awareness of lymphedema management; however, it does not have a direct effect on physical parameters (Shi et al., 2023). Moreover, it is noted that social support groups and web-based education positively affect psychosocial well-being but do not provide significant benefits regarding lymphedema volume or symptom control (Ridner et al., 2020; Omid et al., 2020). In a study by Arinaga et al. (2019), significant improvements in parameters such as edema, volume changes, transepidermal water loss, mental health, self-care duration, and satisfaction were

observed in patients who underwent a holistic self-care program. This finding demonstrates that a holistic approach contributes to physical recovery and improves individuals' emotional and psychological well-being. The results of these studies highlight the need for nurses to focus not only on physical treatment methods but also on interventions such as patient education and psychosocial support in addition to physical therapy techniques. Managing lymphedema requires patients to be conscious of their actions and actively engage in their health processes. Therefore, developing individualized education programs and providing psychosocial support to patients are of great importance.

5. Conclusion

This systematic review evaluated the effectiveness of nursing interventions in the management of lymphedema following breast cancer. The findings demonstrate that physical interventions, such as exercise programs, manual lymphatic drainage, kinesio tape applications, and compression therapy, effectively prevent lymphedema and reduce symptoms. In particular, cognitive-behavioral-based educational programs and web-based support systems have enhanced patients' self-care skills and awareness. However, they showed limited impact in managing physical symptoms. However, despite the lack of statistically significant differences between some interventions, individual intervention types have notably improved patients' comfort and satisfaction. Based on these findings, it is recommended that nursing interventions in lymphedema management be individualized, incorporating both physical and educational approaches to optimize patient outcomes. Future research should comprehensively evaluate the long-term effects of various nursing interventions in lymphedema care to identify the most effective strategies for improving physical and psychosocial outcomes. The resulting evidence will contribute to the development of evidence-based clinical guidelines, enabling the standardization of nursing practices, enhancing patients' quality of life, and reducing the burden on the healthcare system.

Author Contributions

The percentages of the authors' contributions are presented below. All authors reviewed and approved the final version of the manuscript.

	G.A.	B.K.	M.A.
C	30	40	30
D	30	40	30
S		100	
DCP	50		50
DAI	40	20	40
L	45	10	45
W	45	10	45
CR	10	80	10
SR	10	80	10

C= concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision.

Conflict of Interest

The authors declared that there is no conflict of interest.

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References

- Akkaş Gürsoy A, Erdöl H, Okuyan M. 2010. Lenfödem. J Anatolia Nurs Health Sci, 9(4): 82-90.
- Ammitzbøll G, Johansen C, Lanng C, Andersen EW, Kroman N, Zerah B, Hyldegaard O, Wittenkamp MC, Dalton SO. 2019. Progressive resistance training to prevent arm lymphedema in the first year after breast cancer surgery: Results of a randomized controlled trial. Cancer, 125(10): 1683-1692.
- Arıkan Dönmez A, Kapucu S. 2017. Meme kanseri ilişkili lenfödem: Egzersiz yapmak için bir engel midir? Mersin Univ Sağlık Bilim Derg, 10(3): 238-251.
- Arıkan Dönmez A, Özdemir L. 2016. Lenfödemde cilt bakımı ve koruyucu yaklaşımlar. Hacettepe Univ Hemş Fak Derg, 54: 54-64.
- Arinaga Y, Piller N, Sato F, Ishida T. 2019. The 10-minute holistic self-care for patients with breast cancer-related lymphedema: Pilot randomized controlled study. Tohoku J Exp Med, 247(2): 139-147.
- Armer JM, Radina ME, Porock D, Culbertson SD. 2003. Predicting breast cancer-related lymphedema using self-reported symptoms. Nurs Res, 52(6): 370-379.
- Borman P. 2016. Lenfödemde kompresif tedaviler. Turk Klin J Phys Med Rehabil-Spec Top, 9(4): 68-76.
- Bozdemir H, Aygin D. 2021. Effect of structured training program on arm dysfunction, lymphedema, and quality of life after breast cancer surgery. J Pak Med Assoc, 71(5): 1413-1419.
- Çal A, Bahar Z, Gorken I. 2020. Effects of Health Belief Model-based nursing interventions offered at home visits on lymphedema prevention in women with breast cancer: A randomised controlled trial. J Clin Nurs, 29(13-14): 2521-2534.
- Chowdhry M, Rozen WM, Griffiths M. 2016. Lymphatic mapping

- and preoperative imaging in the management of post-mastectomy lymphoedema. Gland Surg, 5(2): 187-196.
- Deveci Z. 2022. Meme kanserine bağlı lenfödem gelişen kadınlarda mobil lenfödem özbakım destek programının, özbakıma, yaşam kalitesine ve lenfödem ile ilgili semptomlara etkisinin incelenmesi. Dokuz Eylül Üniversitesi, Sağlık Bilimleri Enstitüsü, İzmir, Türkiye, pp: 185.
- DiSipio T, Rye S, Newman B, Hayes S. 2013. Incidence of unilateral arm lymphoedema after breast cancer: A systematic review and meta-analysis. Lancet Oncol, 14(6): 500-515.
- Donahue PMC, MacKenzie A, Filipovic A, Koelmeyer L. 2023. Advances in the prevention and treatment of breast cancer-related lymphedema. Breast Cancer Res Treat, 200(1): 1-14.
- Fu MR, Ridner SH, Hu SH, Stewart BR, Cormier JN, Armer JM. 2013. Psychosocial impact of lymphedema: A systematic review of literature from 2004 to 2011. Psychooncology, 22(7): 1466-1484.
- Fu MR. 2005. Breast cancer survivors' intentions of managing lymphedema. Cancer Nurs, 28(6): 446-457.
- Gillespie TC, Sayegh HE, Brunelle CL, Daniell KM, Taghian AG. 2018. Breast cancer-related lymphedema: Risk factors, precautionary measures, and treatments. Gland Surg, 7(4): 379-403.
- Grossman A, Sutton JR. 1985. Endorphins: What are they? How are they measured? What is their role in exercise? Med Sci Sports Exerc, 17(1): 74-81.
- Gül A, Erdim L. 2009. Meme kanseri ameliyatından sonra lenfödem önlenmesinde hemşirelerin eğitim yaklaşımı. J Breast Health, 5(2): 82-86.
- Kilmartin L, Denham T, Fu MR, Yu G, Kuo TT, Axelrod D, Guth AA. 2020. Complementary low-level laser therapy for breast cancer-related lymphedema: A pilot, double-blind, randomized, placebo-controlled study. Lasers Med Sci, 35(1): 95-105.
- Kim Y, Park EY, Lee H. 2023. The effect of myofascial release in patients with breast cancer-related lymphedema: A cross-randomized controlled study. Eur J Phys Rehabil Med, 59(1): 85-93.
- Lampinen R, Romay-Barrero H, Pajero Otero V, et al. 2021. Treatment of breast cancer-related lymphedema using negative pressure massage: A pilot randomized controlled trial. Arch Phys Med Rehabil, 102(8): 1465-1472.e2.
- Lasinski BB. 2013. Complete decongestive therapy for the treatment of lymphedema. Semin Oncol Nurs, 29(1): 20-27.
- Lin Y, Wu C, He C, Yan J, Chen Y, Gao L, Liu R, Cao B. 2022. Effectiveness of three exercise programs and intensive follow-up in improving quality of life, pain, and lymphedema among breast cancer survivors: A randomized, controlled 6-month trial. Support Care Cancer, 31(1): 9.
- Nelson NL. 2016. Breast cancer-related lymphedema and resistance exercise: A systematic review. J Strength Cond Res, 30(9): 2656-2665.
- Omid Z, Khairkhan M, Abolghasemi J, Haghighat S. 2020. Effect of lymphedema self-management group-based education compared with social network-based education on quality of life and fear of cancer recurrence in women with breast cancer: A randomized controlled clinical trial. Qual Life Res, 29(7): 1789-1800.
- O'Toole J, Jammallo LS, Skolny MN, Miller CL, Elliott K, Specht MC, Taghian AG. 2013. Lymphedema following treatment for breast cancer: A new approach to an old problem. Crit Rev Oncol Hematol, 88(2): 437-446.
- Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ, 372:

- n71.
- Pajero Otero V, García Delgado E, Martín Cortijo C, Rodríguez Ramos ML, De Carlos Iriarte E, Gil García A, Romay-Barrero H, Avendaño-Coy J. 2022. Intermittent pneumatic compression versus kinesio taping combined with intensive complex physical therapy for the treatment of upper extremity breast cancer-related lymphedema: A randomized cross-clinical study. *Eur J Cancer Care*, 31(5): e13625.
- Pekyavaş NÖ, Tunay VB, Akbayrak T, Kaya S, Karataş M. 2014. Complex decongestive therapy and taping for patients with post-mastectomy lymphedema: A randomized controlled study. *Eur J Oncol Nurs*, 18(6): 585-590.
- Ridner SH, Fu MR, Hu SH, Stewart BR, Cormier JN, Armer JM. 2013. Psychosocial impact of lymphedema: A systematic review of literature from 2004 to 2011. *Psychooncology*, 22(7): 1466-1484.
- Shi B, Lin Z, Shi X, Guo P, Wang W, Qi X, Zhou C, Zhang H, Liu X, Iv A. 2023. Effects of a lymphedema prevention program based on the theory of knowledge-attitude-practice on postoperative breast cancer patients: A randomized clinical trial. *Cancer Med*, 12(14): 15468-15481.
- Shrihari TG. 2019. Beta endorphins - Holistic therapeutic approach to cancer. *Ann Ibadan Postgrad Med*, 17(2): 111-114.
- Szuba A, Achalu R, Rockson SG. 2002. Decongestive lymphatic therapy for patients with breast carcinoma-associated lymphedema. *Cancer*, 95: 2260-2267.
- Temur K, Kapucu S. 2018. Effective methods of breast cancer-related lymphedema development and improvement of life quality: Self-controlled lymphedema management. *Osmangazi J Med*, 40(1): 121-129.
- Torres-Lacomba M, Navarro-Brazález B, Prieto-Gómez V, Ferrández JC, Bouchet JY, Romay-Barrero H. 2020. Effectiveness of four types of bandages and kinesio-tape for treating breast-cancer-related lymphoedema: A randomized, single-blind, clinical trial. *Clin Rehabil*, 34(9): 1230-1241.
- Vergili Ö, Oktaş B. 2015. Sekonder Lenfödem Tedavisinde Kinezyo Bantlama Tedavisinin Yeri. *Hacettepe Univ Sağlık Bilimleri Fak Derg*, pp: 25-56.
- World Health Organization. 2022. Breast cancer. WHO Fact Sheet (accessed date: February 20, 2025).