Effect of Educational Programme on Reported Self-Care Practice and Symptoms Among Women with Breast Cancer-Related Lymphedema

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Abstract

Background: Lymphedema brought on by breast cancer has a significant impact on people's physical, social, and psychological wellness. Self-care can only be helpful if it is practiced, and women who deal with BCRL on a daily basis need support in the form of follow-up treatment. **Objective:** This study aimed to investigate the effect of an educational programme on self-care practice and reported symptoms among women with BCRL by using a quasi-experimental (one group) pre-post design with repeated measurements. **Methods:** This study was carried out at the outpatient lymphedema clinic of a big metropolitan tertiary hospital in the northern Suez Canal Region using a quasi-experimental design without a control group. A total of 81 patients with BCRL participated in the study and received an education program in the form of face-to-face sessions and an information booklet at the beginning of the study. Patients were evaluated for upper extremity circumference and reported symptom severity and self-care adherence, and they were followed for 6 months. Arm circumference, symptom severity, and level of self-care adherence. **Results:** Arm circumference measurement was decreased significantly with (P 0.060) along with the symptoms that associated with lymphedema (M (31.04) SD (2.26) with P<0.001). Additionally, a significant improvement in patient self-care adherence was noticed (M (91.90) SD (2.61) with P<0.001 compared to the baseline values) during the pre-assessment face. **Significance of results**: The findings of the current study proved that the educational programme intervention enhanced self-care behaviour and decreased lymphedema-related symptoms.

Keywords: breast cancer–related lymphedema, symptoms, self-care practice

Introduction

According to Egypt statistical estimation, mostly women were diagnosed with breast cancer. Its incidence varies significantly across the rural and urban populations, with the greater urban prevalence being stable for all women over 45 years old (**El-Feqi et al., 2020**).The most common cancer among Egyptian women is breast cancer, with a 37.6% incidence rate, whereas breast cancer-related lymphedema (BCRL) in Egypt ranges between 20% to 30% (**Torgbenu et al., 2020; Khater et al., 2019**).

The BCRL is a condition of abnormal swelling accompanied by symptoms brought on by blockage or disruption of the lymphatic system due to cancer therapy (**Guliyeva et al., 2021; Sheng et al., 2020**). BCRL must be considered as a crucial component of the patient's oncology treatment plan since it could significantly impact the patient's psychological, physical, financial, and even emotional well-being (**De Brucker et al., 2016**).Women exposed to BCRL might experience many symptoms, including acute inflammatory episodes, recurring skin infections, discomfort, numbness, and decreased extremity movement (**Park et al., 2021; De Brucker et al., 2016**). Furthermore, many breast cancer survivors experience long-term post-operative difficulties due to BCRL development (**Sierla et al., 2013**). Lymphedema might develop while receiving cancer therapy or years later (**Fu et al., 2015**). Breast cancer survivors may experience long-term post-operative issues due to lymphedema developing, which could happen within days or up to 20 years after surgery (**Davies et al.,**

2020;Torgbenu et al., 2020; Smile et al., 2018; Coriddi et al., 2015).

Lymphedema in patients was graded by using the circumferential tape measures. Lymphedema was deemed non-existent based on circumferential tape measures when there was no heaviness, and the difference between the two arms was 1.27 cm or less. When heaviness existed, and the difference between the two arms was 1.27 cm or less, it was deemed moderate. When the distance between the two arms was between 1.27 and 5.08 cm, it was considered moderate. When there was a 5.08 cm or more disparity between the two arms, it was considered serious **(Tokumoto et al., 2022; Karayurt et al., 2021).**

According to the BCRL classification, there are four phases of lymphedema, from 0 to 3. Stage 0, also known as latency, describes an increased risk of swelling even when there is no obvious edema due to a damaged lymphatic system from surgical lymph node excision, scarring, and radiation damage. Stage 1 lymphedema is reversible. With therapy, Stage 2 is largely or completely irreversible. Stage 3, elephantiasis, is a lymphatic system blockage caused most frequently by a parasite disease and very seldom, if ever, by the side effects of breast cancer treatment **(Davies et al., 2020; Smile et al., 2018).**

Lymphedema symptoms might signify a latent stage of lymphedema when alterations such as the weight of extremities and a sense of tightness (e.g., snug-fitting jewellery or clothing) cannot be seen by objective measurements. Additionally, symptoms reports may be crucial in identifying lymphedema in clinical practice **(Togawa et al., 2021; Bloomquist et al., 2018; Fuet al., 2015).** Once symptoms start, lymphedema develops into a chronic condition requiring ongoing symptom management with regular treatment schedules to stop the development and control severe symptoms **(Togawa et al., 2021).**

Moreover, the BCRL involves a variety of modalities to maintain and promote arm health. Such treatments include self-administered lymphatic drainage, compression garments, therapeutic exercise, and skin care. The frequency conduction of BCRL self-care modalities should be conducted varies. For example, meticulous skin care is a daily activity, compression garments are recommended for use during all waking hours, self-administered lymphatic massage is recommended four times per week, and a pneumatic compression pump therapy recommended for thirty minutes daily **(Liu et al., 2021; Davies et al., 2020; Buchan et al., 2016; Brown et al., 2015).** Therefore, complex BCRL self-care criteria were linked to patient hardship, decreased quality of life, and low compliance **(Perdomo et al., 2022).**

Several studies have highlighted the importance of patient education in areas such as lymphedema awareness, self-care procedures, and risk-reduction practices. However, patient education and risk reduction measures are necessary to improve a patient's quality of life **(Cansız et al., 2022; Perdomo et al., 2022; Orhan et al., 2020).** Patient education on proper skincare maintenance is critical for complex decongestive therapy (CDT) to lower the risk of lymphedema, aggravating inflammation, and infection. Grooming, moisturizing, applying sunscreen, and avoiding restrictions on the use of tourniquets or blood pressure cuffs should all be covered in self-care instructions **(Perdomo et al., 2020; Brown et al., 2014).**

Significance of the study

Education for women with BCRL is a critical component of nursing care. Additionally, patient education should include dietary counseling and strategies to encourage healthy weight management as an additional strategy for preventing the development and progression of lymphedema **(Liu et al., 2015).** Nurses have an essential role in recognizing and addressing concerns, as well as meeting the needs for information and support to improve the quality of life for patients with breast cancer. The foundation for excellent nursing care is the knowledge to identify factors impacting a person's quality of life **(Abu Sharour et al., 2019).** Nurses worldwide aim to encourage breast cancer survivors to practice self-care to reduce their risk of exacerbation **(El-Feqi et al., 2020; Torgbenu et al., 2020).** Although for BCRL, there is no effective cure. Thus, women's education focuses on lifelong

self-care practices. Furthermore, research to date has not looked at whether an intervention educational program affects how women with BCRL practice self-care and report their symptoms effectively. Less is known about the symptoms associated with lymphedema and the ability of women to practice self-care.

The hypotheses of the present research are as follows:

H1-a: The women with BCRL their self-care will improve after educational program intervention.

H1-b: The lymphedema-related symptoms will reduce after the educational program intervention.

Subjects and Methods

Design

The effect of an educational program on self-care practice and reported symptoms among women with BCRL was investigated using a quasi-experimental design (one group) pre-post-test with repeated measurements.

Setting

The study was conducted in a sizable urban tertiary hospital in the northern Suez Canal Region's lymphedema outpatient clinic. This clinic provides lymphedema diagnosis and treatment, patient education, and long-term follow-up. The outpatient clinic staff includes a nurse and a doctor. The doctor provides lymphedema therapy and follow-up care. Additionally, the nurse educates patients diagnosed with lymphedema about their condition.

Sample

A purposive sample of women with Breast cancer who could read and write Arabic had been diagnosed with lymphedema and had finished breast cancer treatment six months prior to the study. The following conditions were excluded: women who were diagnosed with lymphedema resulting from another medical condition, women with thoracic outlet syndrome, as well as women with a medical condition on the operated side that impairs

motor function. The study data were collected from women who agree to participate in this study from medical records and during personal interviews between May 2021 and December 2021.

Sample Size Calculation

Open Epi software was used to determine the sample size for studying the effect of an education program on self-care practice and reported symptoms among women with BCRL. At an alpha error of 1% (significance 99%) and β error of 5% (study power 95%), the average lymphedema-related risk behaviours score was 19.85 ± 1.30; after one month, it was 20.46 ± 0.67 **(McLaren et al., 2017).** This resulted 81 patients in each category being determined as the sample size.

Data Collection Tools

Tool 1 Demographic characteristics

The types of information acquired by this tool include demographic and clinical variables. The form was created by the researcher and contained 17 questions, 10 of which were about clinical characteristics such as treatment methods, breast cancer stage, chronic diseases, type of surgery, time since lymphedema diagnosis, and BMI. Five of the questions were about demographic characteristics such as occupation, education, age, and marital status.

Tool 2. Limb Circumference Measurements.

The measures of limb circumference were taken at the wrist, every 4 cm from the wrist to the axilla, and the area of the hand closest to the metacarpals. Subclinical lymphedema was defined as; when the difference in circumference between the limbs from 1 to 2 cm; mild lymphedema was defined, as the difference between 2 to 3 cm; moderate lymphedema was defined, as the difference between 3 to 5 cm; and severe lymphedema was defined, when the difference is more than 5 cm. A researcher measured the circumference of the limbs using flexible, nonelastic tape **(Rafn et al., 2019; Brown et al., 2015).**

Tool 3. The Breast Cancer-Related Lymphedema (BCRL) Self-Care Scale

It was developed by **(Deveci et al., 2023)** and consisted of 31 items. Items numbered 4, 5, 6, 8, 9, 10, 11, 20, 21, 22, and 28 were reverse-scored for negative behaviours such as the following: lifting weights with the afflicted arm, taking pressure in the affected arm, donating blood, receiving an injection, and completing repetitious housework like dishwashing. The scale might be utilized by medical practitioners in decision-making processes, during the follow-up of patient adherence, and in standardizing the evaluation of self-care behaviours of BCRL patients. Additionally, it may be used to assess the efficacy of self-care practice-related treatments. The scale may also help in lymphedema treatment and prevention while enhancing patient quality of life. On a Likert-type scale, each item is evaluated from 1 to 4 according to how frequently the conduct occurs. Higher scores indicate greater self-care performance. The scale's lowest score is 31, while its maximum is 124. The Arabic translation of the English edition underwent testing, and Cronbach's α values ranged from .930 to .960. Throughout the intervention, patients completed this scale twice: once during the face-to-face sessions during the pre-assessment and another time during the recruiting process.

Tool 4. Women's reported Lymphedema-related Symptoms

The study used the tool to look at the specificity of symptoms for spotting BCRL (**Fu et al., 2015.** Lymphedema symptoms which include increased arm swelling, limb mobility, heaviness, breast swelling, tightness, firmness, numbness, stiffness, pain, tenderness, soreness, stiffness, aching, redness, burning, blistering, tingling, and stabbing (pins and needles). Each item could be evaluated from 0 (no presence of a particular symptom) to 4 (greatest severity of a given symptom) on a Likert-type scale. Higher scores denote the occurrence of more severe symptoms. In this research, each symptom was treated as a categorical variable (i.e., the presence or absence of a specific symptom), and the total number of symptoms were treated as a continuous variable, with an absolute value of 0 signifying the complete absence of symptoms and an absolute value of 22 signifying the presence of all possible symptoms. The instrument had efficient internal consistency, as seen by its 0.92 Cronbach's alpha value.

Ethical Consideration

At each follow-up appointment, participants were questioned about the program meme's safety by asking if it caused any pain or harm to them. The ethics committee (ethical code: NO 54) approved the current study. After obtaining the relevant permits, the researcher explained the study's goal and participants' rights to the women who agree to participate in the study. All subjects who participated in the study gave verbal and written approval consent.

Pilot Study

The pilot study was conducted to check the feasibility, practicability, construct validity BCRL Self-Care Practice Scale and Women's reported Lymphedema-related Symptoms tool. A pilot study was conducted with 8 women with the same inclusion criteria. The pilot participants found the language and questions understandable and thus had no further revisions to the questionnaires. Data from the pilot study were not included in the final analysis.

Administrative design:

Before the study was conducted, the Director of the designated study setting was requested in a formal letter from the Dean of the Faculty of Nursing at Port Said University, asking for his cooperation and permission to conduct the study after explaining its purpose. To better cooperate during the data collection process and to inform them of the research's goals and objectives, meetings and talks were held between the researcher and administrative staff.

Data Collection

The content of the educational intervention included six educational sessions; its time include from 55 to 60 minutes. Presentations, group discussions, asking and responding to queries, and using educational posters, booklets, and PowerPoints all were used during the explanation of the content of the session. The first session discussed breast cancer-related lymphedema, its definition, causes, symptoms, and difficulties. The physician representing the health facility, and a family member attended the second session as arbitrary norms. In addition, a 55-year-old woman with lymphedema for 36 months was asked to discuss her condition, risk factors, symptoms, self-care journey, and diagnosis. In the third and fourth sessions, participants were asked to discuss the importance and role of self-care practice for BCRL, arm measurement, benefits of weight reduction, and instructions to optimize BMI. The importance of effective arm and shoulder

workouts was emphasized in the fifth and sixth sessions.

Additionally, throughout the presentation, patients were taught the arm and shoulder exercises using the demonstration approach. For 12 months, the patients were required to exercise at least three days per week, twice each day (morning and evening). Compression clothing was advised, especially during physical activity and throughout the day. Additionally, patients were instructed to remove their compression clothing at night before bed. Women responded to the questionnaire six months following the educational intervention. To evaluate lymphedema, the researcher measured arm circumference and BMI. The data on women who reported lymphedema-related symptoms and self-care practice were obtained. The educational sessions were held with the study group for six weeks each session time length was from 45-60 minutes, session impact on women condition was based on their performance of the shoulder and arm exercises as well improving their knowledge about lymphedema. The attendees were also handed a booklet with all the information from the instructional material for their future use. The content of the booklet was based on the participants identified needs during the pre-assessment stage.

Telephone contact and booster sessions were available once a week in the first month and once a month in the next five months, lasting 10 to 15 minutes. The goals of telephone contact and booster sessions were to reinforce what participants learned during the first two sessions, identify any remaining lymphedema self-care practice concerns, review the essentials of daily lymphedema self-care practices, and remind patients to engage in daily lymphedema self-care practices.

Data Analysis

The gathered data were coded, assessed, and statistically evaluated using the Statistical Package for Social Sciences (SPSS) version 25. The qualitative variables of frequency and percentages, as well as mean ±SD, were used to summarise the characteristics of the BCRL patients (quantitative continuous variables). For the comparison of categorical variables, chi-square (χ^2) was utilized. The mean scores of the lymphedema-related symptoms scale and the self-care practice scale were compared before and after the intervention programme using a paired t-test. The connection between the self-care practice scale and the lymphedema-related symptoms scale scores before and after the intervention was calculated with Pearson's correlation coefficient. At P≤0.05, the difference was deemed significant.

Results

The mean age of the women included in the research was 51.68 ± 3.96 years old. Among all the females, 39.5% were college graduates, 71% were employed full-time, 82.7% were married, and 80.2% received health education as routine care before the surgery (Table 1).

Table 2 presented the women's clinical characteristics. At the time of diagnosis, 40.8% of the women had stage II breast cancer; 82.7% had undergone a modified radical mastectomy; the interval between the breast cancer diagnosis and the lymphedema diagnosis was among 58% for more than 24 months. All the women with BCRL were right-handed and had lymphedema in the arm at their dominant side.

As shown in Table 3, the disparity in limb circumference was reduced at six months after program intervention and remained stable during the whole intervention period. The mean value of BMI among women with BCRL showed insignificant change. It was 30.35 kg/m^2 ± 3.16 pre-programme intervention and 30.31 kg/m^2± 3.10 at post-programme intervention with (P = 0.08).

Table 4 showed that lymphedema-related self-care was significantly improved at six months post-intervention compared with the baseline. A higher score after intervention represents improved self-care practice.

Table 5 showed the comparison between the findings of the reported lymphedema-related symptoms scores pre- and post-program intervention and proved a significant decrease in reported symptoms after six months of the programme intervention.

Table 6 showed that the self-care practice score pre-intervention was a significantly mild negative correlation with self-care practice post-programme intervention. Additionally, there was a positive correlation between self-care and lymphedema-related symptoms prior to programme intervention but a negative correlation between increased self-care behaviour and a reduction in lymphedema-related symptoms following programme intervention.

Table (1): Frequency distribution of Women characteristics with Breast Cancer Related Lymphedema (n=81)

demographic characteristics variables	Frequency (N)	Percent (%)
Age (years)		
45 -	26	32.1
50 –	30	37.0
55 - 60	25	30.9
Mean ±SD		
	51.68 ± 3.96 years	
Marital status		
Married	67	82.7
Nont married	14	17.3
Educational level		
Read & write.	13	16.0
High school or less	22	27.2
Some college	23	39.5
Bachelor	14	17.3
Employment / Occupation		
Professional	26	32.1
Clerical or service	29	35.8
Homemaker	16	19.8
Unemployed	10	12.3
Have you received health education about lymphedema self-care?		
- Yes	65	80.2
- No	16	19.8

Table (2): Frequency distribution of the studied women in relation to medical health history and Clinical Characteristics of the Women with Breast Cancer Related Lymphedema (n=81).

Present health history	Frequency (N)	Percent (%)
Chronic disease		
Hypertension	32	39.5
Diabetes	21	25.9
GIT	16	19.8
Rheumatic diseases	12	15.8
Months since cancer diagnosis:		
24-	47	58.0
48-	30	37.1
72+	4	4.9
stage (pathology report) :		
Breast Cancer Stage :	24	29.6
- Stage 1	33	40.8
- Stage 2	24	29.6
- Stage 3		
Treatment:		
Radiation	16	19.8
Chemotherapy	63	77.8
Tamoxifen	2	2.5
Months since the lymphedema diagnosis		
- 40-	40	49.4
- 50-	9	11.1
- 60-	16	19.8
- 70-80	16	19.7
Months since last lymphedema treatment		
- 20-	49	60.5
- 25-	18	22.2
- 30-35	14	17.3
Type of surgery:		
Mastectomy	67	82.7
Lumpectomy	14	17.3
Surgery on the dominant arm Dominant hand	81	100.0

Table (3): Lymphedema stage and BMI pre-intervention and post-intervention

Variable	Items	Pre		Post		Significance test
		No	%	No	%	
Lymphedema stage	Subclinical Mild	0	0.0	4	4.9	χ^2=5.62, P 0.060
	Moderate	26	32.1	32	39.5	
		55	67.9	45	55.6	
BMI	<18.5(underweight)	0	0.0	0	0.0	
	18.5-24.99(normal)	2	2.5	2	2.5	
	25-29.99 (overweight)	30	37.0	30	37.0	
	30+ (obese)	49	60.5	49	60.5	
	Mean ± SD	30.35 ± 3.16		30.31 ± 3.10		t=1.754, P=0.083

Table (4): The women reported Breast Cancer Related Lymphedema self-care pre and post-intervention

Self-care scores	Pre-Intervention	Post Intervention	Significance test
Mean	82.04	91.90	Paired t = 24.190,
± SD	± 1.68	± 2.61	P<0.001*

* P < .05

Table (5): The women reported Lymphedema-related Symptoms Pre- and post-intervention.

symptoms severity score	Pre-intervention	Post-intervention	Significance test
Mean	55.78	31.04	Paired t = 78.752,
± SD	± 2.14	± 2.26	P<0.001*

* P < .05

Table (6): Correlation matrix for self-care practice and Lymphedema-related Symptoms pre- and post-intervention

Variables	Self-care practice pre-intervention	Self-care practice post-intervention	Lymphedema-related symptoms pre-intervention	Lymphedema-related Symptoms post-intervention
Self-care practice pre-intervention		r = - 0.438 P <0.001*	r = 0.245 P 0.028	r = -0.417 P <0.001*
Self-care practice post-intervention			r = - 0.187 P 0.094	r = -0.241 P 0.030
Lymphedema-related symptoms pre-intervention				r = 0.177 P 0.114

* P < .05

Discussion

The lymphedema educational intervention for self-care practice showed the positive effect of the programme to optimize self-care practice and reduced lymphedema-related symptoms. Many studies suggested to focus on the education programme to reducing the severity of symptoms and improve arm function rather than decreasing the objective of arm volume measurement **(Abu Sharour,** **2019; Dönmez & Kapucu, 2017 et al., 2017; Brown et al., 2014).** When the face-to-face intervention sessions were over, the women's self-care practices dramatically improved and continued during the six-month follow-up. This result agreed with the findings of the study done by **(Temur & Kapucu, 2019; Cansz et al., 2022)** who reported that education and consultancy, and routine follow-ups within the context of self- lymphedema management were effective in improving the physical symptoms

and increasing women's motivation toward self-care.

The current study showed that the women knowledge about BCRL self-care practices was inadequate. Except for avoiding constriction during blood pressure checks, IV infusions, and blood draws associated with their breast cancer treatment, but none of the participants knew about the risk-reducing measures. Furthermore, the results of lymphedema self-care education revealed that, while the majority of participants identified this as part of their treatment, a significant number considered it insufficient. The findings corroborated and supplemented with a prior study done by **(Abu Sharour, 2019)**who found that doctors and nurses had minimal opportunity to educate patients about BCRL. Additionally, they found that 70% of the participants misjudged the BCRL evaluation and examination. This is because they received insufficient exposure during their undergraduate clinical experience.

According to the findings of several experts, people manage their illnesses by how they see the situation **(Fan et al., 2014)**. Women must have access to get sufficient information to learn about and comprehend self-care for lymphedema to be able to make choices and follow the preventative measures. Additionally, self-care instruction should be reinforced by routine follow-up meetings, evaluation of women's self-care and symptoms by qualified nurses who interact with these patients effectively **(Temur & Kapucu, 2019; Ostby et al., 2018; Dönmez & Kapucu, 2017 et al., 2017)**. Oncology nurses must deliver the best possible treatment based on their skills and experience. So, nurses experience improve their abilities to determine the standard of care that should be given to such group of patients. During patient encounters, oncology nurses may need to assess their patients' lymphedema self-care activities to ascertain what is being done, whether self-care is sufficient to control lymphedema-related symptoms, and whether a modification to self-care activities is necessary **(Abu Sharour, 2019; Dönmez & Kapucu, 2017& Kapucu, 2017)**. In addition, it is well established that cancer diagnosis and therapies could cause exhaustion that related to the

disease, as well cognitive deficits which linked to stress that may affect patients learning ability **(Perdomo et al., 2022)**. The content, delivery methods, and selecting the ideal timing of BCRL instruction may all be impacted negatively by psychological difficulties across patients' survival **(Cansız et al., 2022; Fan et al., 2014)**. Therefore, the presentation and components discussion of the program intervention with simplified verbal persuasion, while the hands-on practice components were congruent with the mastery and vicarious experiences. During the hands-on practice component, participants engaged in skin care, extremities elevation, massage, and exercise **(Fan et al., 2014)**.

The current study found that women in the pre-intervention program reported suboptimal BCRL self-care due to a lack of interactive patient-centred education programs. Women also reported several obstacles and burdens to BCRL self-care that affect their ability to adapt. For example, the majority of women in this study reported a lack of time to apply self-care practices due to household chores and family care, so, the lack of results was due to the development of swelling, and a lack of resources. Women also stated that they did not value self-care as much as housework, that their family did not spend much time each day on it, and that they began self-care after housework was completed. The results were consistent with those of previous studies supporting that the majority of breast cancer survivors (66%) spend ≥150 min·wk−1 engaging in BCRL self-care activities **(Brown et al., 2015)**.

The present study revealed that reported symptom intensity and distress scores were higher pre-intervention programme. Most of the women in this study reported physical symptoms such as swelling, heaviness, tightness, and limited movement of the arm, finger, and shoulder. According to previous studies done by **(Togawa et al., 2021; Torgbenu et al., 2020; Fu et al., 2015)** reported that swelling (63%), heaviness (60%), soreness (45%), and numbness (38%) were all among the most reported symptoms by the women with lymphedema.

The current study also showed a positive association between distress related to symptom intensity and women who reported suboptimal self-care practice. The women who had suboptimal self-care before the programme intervention, could result from symptom-intensity distress. This result was in accordance with **(Cansız et al., 2022; Liu et al., 2021; Brown et al., 2015)** who concluded that physiological factors were recognized as hindrances to effective lymphedema self-care. Therefore, any of the symptoms may cause difficulty in performing self-care. Additionally, some researchers found that women with BCRL frequently experience multiple symptoms that necessitate complicated self-management routines, and that symptom distress was caused by the disturbance in everyday life and domestic tasks **(Davies et al., 2020; Coriddi et al., 2015; Deng et al., 2014).**

The findings of this study indicate a conflict between increased self-care following program intervention and a decrease in distress symptoms. The women reported a substantial decrease in symptoms following program intervention compared to pre-intervention.Following the intervention, the women reported improvement in the upper limb function because they become oriented about the effect and causes of lymphedema symptoms, skin care, daily living adjustments, and basic cardiovascular activity such as walking, and protective gear. This conclusion was in line with the finding of study done by **(Ostbly et al., 2014),** who found that the ability of patients to maintain their health and relieve lymphedema-related symptoms might be an indicator of optimal self-care. Numerous studies had shown that increasing physical activity and reducing symptoms of distress through exercise after programme intervention led to equivalent improvements in aerobic fitness, muscular endurance, quality of life, and lymphatic fluid flow **(Liu et al., 2021; Togawa et al., 2021; Buchan et al ., 2016; Sierla et al., 2013).** These findings are particularly pertinent because they imply that after the programme intervention, women who engage in resistance or aerobic exercise will have less BCRL and more functional well-being.

The present study revealed that women who were obese before the programme intervention significantly improved their BMI after the programme intervention. Research carried out by **(Fu et al., 2014)** demonstrated that the risk of lymphatic dysfunction increases with elevated BMI. Moreover, **Fu et al., 2021)** also found that women are 1.11 times more likely to develop lymphedema which raised with every 1 kg/m2 in their BMI. This is because increasing body mass causes an imbalance in lymph transport and capacity, resulting in excess extracellular fluid. While women had significant improvement in BCRL symptoms after programme intervention, this finding was in the same line with a study done by **(Liu et al., 2021)** who reported that a programme based on instructions to optimize BMI would improve lymphatic flow and decrease symptoms of distress. Also, a study done by **(Tsai et al., 2020; Wu et al., 2019)** indicated that improved BMI would improve muscle-pumping efficiency and lymphatic flow.

Conclusion

Based on the findings of this research, the educational programmes intervention could enhance women's self-care practices and reduce arm circumference and lymphedema-related symptoms. Furthermore, a positive association was observed between symptom intensity distress and women who reported suboptimal self-care practices pre-programme intervention. Women reported a substantial drop in the number of symptoms following a programme intervention compared to pre-intervention, which showed a negative link between increased self-care after programme intervention and reduced feelings of distress. Additionally, the findings of this study demonstrate that women's education alone is insufficient for managing lymphedema; instead, it should be associated with effective nursing strategies which involve patients' active participation, to encourage to maintain their motivations, and long-term, routine follow-up via telephone and face-to-face contact. Through certified programmes, nurses may refresh their understanding about lymphatic drainage and exercise approaches. Through this, nurses may incorporate the most current knowledge into

clinical settings and control or treat lymphedema in its early phases.

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