

Knowledge and Self Care Practices for Women with Breast Cancer Related Lymphedema

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Abstract

Background: Breast cancer related lymphedema represents a major complication of breast cancer treatment, impacting the quality of life of breast cancer survivors. Patients with lymphedema need to conduct lifelong self care activities to control the progression of swelling, manage lymphedema-associated symptom burden, and minimize long term negative outcomes. **Aim:** This study aimed to assess knowledge and self care practices of women with breast cancer related lymphedema. **Study design:** A descriptive study design was utilized to conduct this study. **Setting:** This study was conducted in the outpatient breast clinic at Oncology Center and Nuclear Medicine, affiliated to Ain Shams University Hospitals. **Subjects:** A purposive sample of 50 women newly diagnosed with breast cancer related lymphedema, post mastectomy, and treated with radiotherapy. **Data collection tools:** A structured interview questionnaire for women with breast cancer related lymphedema, and self care practices questionnaire. **Results:** The mean age of the studied women was 47.71 ± 7.16 , and about one fifth of them had satisfactory level of total knowledge regarding breast cancer related lymphedema, also; the minority of them had adequate level of total lymphedema self care practices. Moreover there is statistically significant difference between the self care practices of the studied women and their educational level. **Conclusion:** The majority of the studied women had unsatisfactory knowledge regarding breast cancer related lymphedema, and almost of them had inadequate lymphedema self care practices. **Recommendations:** Educational programs about lymphedema and risk reduction methods after the breast surgery are strongly needed. Also, continuous in-service educational programs should be held for all the health care team working in breast cancer units. In addition, further researches are recommended to assess barriers to self care among patients with breast cancer related lymphedema.

Key words: Breast cancer, Lymphedema, Self care practices, Women, Knowledge.

Introduction

Breast cancer (BC) is the most commonly occurring cancer in women (**World Cancer Research Fund, 2018**). One complication of BC treatments is lymphedema (LE), a chronic health problem, troublesome to both patients and health professionals (**Wanchai, Armer, Stewart & Lasinski, 2016**). LE is defined as the interstitial collection of

protein-rich fluid due to disruption of lymphatic flow (**Kayiran, Cruz, Tane & Soran, 2017**). LE Classification is divided into two groups according to LE etiology; idiopathic / primary or acquired / secondary LE (**Timby & Simth, 2014**).

Breast cancer related lymphedema (BCRL) represents a major complication of BC treatment, impacting the quality of life (QOL) on BC survivors that develop it. It

may lead to symptoms such as pain, fatigue, depression, and eventual deterioration in QOL (Timothy et al., 2018), BC is the most common type of cancer in Egypt for women, 34% of Egyptian women suffer from BC (Emara, 2017). Women treated for BC are facing a life-time risk of developing LE, its incidence values ranging between 20% and 30% have been considered realistic by several authors (Stuiver, Ten Tusscher & McNeely, 2017). This risk increases after combination therapy with axillary surgery and radiation, reaching 25–40% (Shaitelman et al., 2015).

Oncology nurses are essential members of the interdisciplinary team in the management and treatment of LE (McCaulley & Smith, 2014). Nurses play a crucial role in the prevention of complications associated with LE by educating the patient about signs and symptoms of acute inflammatory episodes and LE management (Zuther, 2013).

When caring for patients with LE, nurses should encourage self-care, provide emotional support, offer patient and lay caregiver education, assess symptoms that patients with LE may be experiencing and develop a plan of management (Ridner, 2013). Also, LE awareness and education, along with attention to both cognitive and affective responses to the health threat situation are important patient-centered management strategies (Sherman, Miller, Roussi & Taylor, 2015).

Self care strategies for patients with BCRL may include compression bandaging, resistive or aerobic exercise, self applied manual lymphatic drainage, intermittent pneumatic compression therapy (IPCT), elevation of the affected extremity, and weight management (Hutchison, 2018).

BCRL self-care generally includes wearing a compression garment and/or self-bandaging, conducting self-MLD, and completing skin care and arm exercises. Lifelong self care is required to slow the progression of LE and reduce negative health outcomes. LE self care practices target swelling and skin; however, self-care should also address associated physical and psychosocial symptoms (Ridner et al., 2016).

Significance of the study:

Nearly 2 million women with a diagnosis of BC annually worldwide, LE represents a significant burden to global public health (McLaughlin et al., 2017). More than one in five of BC patients will develop BCRL, which is one of the most disabling complications after BC and related treatments (Ezzo et al., 2015),

BCRL can cause abnormal swelling in the breast, trunk or upper extremity on the side of treatment resulting in arm tightness, heaviness/fullness, pain, and impaired limb function (Chowdhry M, Rozen WM, Griffiths M. (2016); furthermore, as it progresses, adipose deposition and fibrosis can result (Hespe, Nores, Huang & Mehrara, 2017). So, it has a significant impact on activities of daily living (ADLs), a changed view of self, reduced physical activity and lower QOL (Thomas, Quinlan, Kowalski, Spriggs & Hamoline, 2014).

Patients with LE need to conduct lifelong self care activities to control the progression of swelling, manage lymphedema-associated symptom burden, and minimize long term negative outcomes (Ridner, Deng & Rhoten, 2018).

Aim of the study

This study aimed to assess knowledge and self care practices of

women with breast cancer related lymphedema.

Research question

What are the knowledge and self care practices of women with breast cancer related lymphedema?

Subjects and Methods

Technical Design

▪ Research design

A descriptive design was utilized to achieve the aim of the present study.

▪ Research setting

The study The study was conducted in the outpatient breast clinic at Oncology Center and Nuclear Medicine affiliated to Ain Shams University Hospitals, it was on the ground floor and it consisted of two rooms, one room contained a bed, an office, three chairs and a bathroom and the another room contained two offices, a bed with curtain, six chairs and weight and height measurement scales. The outpatient breast clinic received women daily except Friday and radiotherapy sessions were taken in 5 days from Saturday to Wednesday.

▪ Subjects

A purposive sample of 50 women with BCRL was recruited in this study. The sample size calculation done based on power analysis, as about 400 women in the year (2014-2015) admitted to the previous mentioned setting. The test result was as follows:

Type I error with significant level (α) = 0.5

Type II error by power test (1-B) = 90%

The minimum sample were (50) cases.

▪ Inclusion criteria

The subjects included in the present study were selected according to the following criteria: women newly diagnosed with breast cancer related lymphedema, post mastectomy, treated with radiotherapy, and didn't receive any educational instructions about breast cancer related lymphedema and agreed to participate in the study.

▪ Tools for data collection

The study data was collected through the following two tools:

1- A Structured Interview Questionnaire for Women with breast cancer related lymphedema:

This tool was developed by the researcher in Arabic language based on reviewing the related literatures (**American Cancer Society (2015), Timby & Simth (2014), Cashman et al., (2013) and Irish Cancer Society (2013)**). It was used to assess women's knowledge regarding BC, BCRL and self care practices regarding LE. It included four parts:

First part: Socio-demographic characteristics of the women with BCRL. It consisted of 7 questions regarding age, marital status, educational level, occupation, monthly income, treatment costs, and residence.

Second part: Medical health history of the women with breast cancer related lymphedema. It included the followings:

- **Present history** (It consisted of 11 closed ended and MCQ questions regarding weight, height, body mass index, chief complaint, medical diagnosis, breast cancer stage, time since breast cancer diagnosis, time

since mastectomy, time since starting RT sessions, dominant hand, LE location).

- **Past history** (It consisted of 4 MCQ and closed ended questions regarding chronic diseases, previous hospitalization, other surgery and medications not related to the disease).

- **Family history** (It consisted of 2 yes or no questions regarding family history suffering from the same disease or other oncology disease).

Third part: It was used to assess women's knowledge regarding BC, BCRL and LE self care practices. It included 3 sections as follow:

Section 1: BC information (4 questions) including definition, risk factors, diagnostic measures and treatment.

Section 2: BCRL information (8 questions) including definition, causes, signs and symptoms, sites, when occurred, stages, complications and treatment.

Section 3: LE self care practices information (12 questions) including general practices to reduce BCRL (2 questions), pain control and exercises (3 questions), hand and arm care (2 questions), healthy nutrition (1 question), safe drugs intake (1 question), psychological stress (1 question), sexual relation (1 question) and depression (1 question).

Fourth part: It was used to assess women's information source regarding BCRL, included one MCQ question about BCRL information source.

Scoring system for the women's knowledge

Regarding scoring of women's knowledge assessment, this tool consisted of 24 questions, which were grouped into 3 sections. The responses were either "yes" or "no", the correct answer was "one score"

while the wrong one was "zero". The scores of each statement for every section were summed up giving a total score for every section, then the total score for all the knowledge questionnaire were calculated.

Women's knowledge was categorized according to statistical analysis into satisfactory and unsatisfactory, as follows:

- $\geq 70\%$ was considered satisfactory.

- $<70\%$ was considered unsatisfactory.

2- Lymphedema Self Care Practices Questionnaire:

This tool was used to assess women self care practices after BCRL. It was developed by the researcher in Arabic language based on reviewing the related literatures (**Donmez & Kapucu, (2016), American Cancer Society (2015), Regional Cancer Care (2014), Lewis, Dirksen, Heitkemper & Bucher (2014), and Cashman et al., (2013)**). It included 10 parts as follow; self care practices including general practices to reduce BCRL (7 items), skin care (10 items), skin wound care (8 items), control of pain (4 items), healthy nutrition (7 items), safe drug use (3 items), use of compression bandages (4 items) general exercises (7 items) sexual relation (8 items) controlling of psychological pressures (9 items).

• Scoring system

The responses for the previous 63 items were scaled either "yes" or "no", the yes answer has got "one score" while the no answer has got "zero".

The total score for lymphedema self care practices were calculated. The parts and total questionnaire were categorized according to

statistical analysis into adequate or inadequate practices, as follows:

- $\geq 70\%$ was considered adequate practices.
- $<70\%$ was considered inadequate practices.

Administrative design:

An official letter was issued from the faculty of nursing, Ain Shams University to the medical and nursing directors of Oncology Center and Nuclear Medicine affiliated to Ain Shams University Hospitals explaining the purpose of the study and requesting the permission for data collection from the study group.

Operational design

It included preparatory phase, tools validity and reliability, pilot study and field work.

A. Preparatory phase

It included reviewing of the current and related literature and theoretical knowledge of the various aspects of this issue using books, articles, periodicals, magazines and internet in order to develop the tools for data collection.

B. Tools validity and reliability (Appendix VI)

Validity: was tested through a jury of (7) experts; (5) medical surgical nursing experts (2) professors and (3) assistant professors at faculty of nursing, Ain Shams University and (2) medical consultants of the Oncology Departments at Ain Shams University Hospitals. The experts reviewed the tools for clarity, relevance, comprehensive-ness, simplicity and appropriate-ness; minor modifications were done.

Testing reliability: of the proposed tools was done statistically by Cronbach alpha test. The first tool (Structured interview questionnaire for women with BCRL) was reliable at (0.795), the second tool (LE self care practices questionnaire) was reliable at (0.829).

Ethical consideration

The ethical research consideration in the study included the following:

- The research approval obtained from the ethical committee in faculty of nursing, Ain Shams University before starting the study.
- The researcher clarified the objectives and aim of the study to women before obtaining their consent to participate in the study.
- The researcher assured maintaining anonymity and confidentiality of subjected data.
- Women were informed that they are allowed to choose either to participate or withdraw from the study at any time.
- Values, cultures and benefits were respected.

C. Pilot study

A pilot study was conducted on 10% of the study subjects (5 women with BCRL) in order to test the applicability of the study tools, the clarity of the study tools, as well as estimating the average time needed to complete the tools. Accordingly, necessary modifications were made for the final development of the study tools. Women selected for the pilot study were excluded from the study subjects.

D. Field work

The collection of data lasted over a period of three months; starting from the beginning of October 2016 to the ending in December 2016.

▪ The researcher visited the outpatient breast clinic three days from Sunday to Wednesday during morning shifts (9.00 am to 2.00 pm).

▪ The women who fulfilled the inclusion criteria were selected.

▪ The researcher obtained the women's oral consent for participating in this study after explaining the aim of the study.

▪ Filling in the previously mentioned tools was done by the researcher.

▪ First demographic and clinical data were collected from the women's medical records, from the women themselves and sometimes from relatives. Then interview questionnaires were filled by the researcher for collecting data regarding women's knowledge and lymphedema self care practices.

▪ These tools were completed within an average time 60 minutes.

IV. Statistical Design

The data were collected, coded and entered into a suitable excel sheet. Data were analyzed using the statistical package for social sciences, version 20.0 (SPSS). The statistical analysis was done using percentage (%), mean, standard deviation; Chi-Square (χ^2) was used in order to compare proportions between two qualitative parameters. The observed differences and association were considered as follows:

- Non significant (NS) $P > 0.05$
- Significant (S) $P \leq 0.05$
- Highly Significant (HS) $P \leq 0.01$

Limitations of the study

1.The contact with three women who accepted to participate in the study was missed. So, the researcher replaced them with another three women.

Result

Table (1): reveals that, 46% of the study sample were between age 40 to less than 50 years with mean 47.71 ± 7.16 ; also, 86% of them were married. Regarding to educational level, 38% of them had middle education. In relation to occupation; it was found that, 62 % of them were housewives, and 18% of them were worked in governmental work; meanwhile, 14% of them were worked in private work; also, 6% of them were retired. As regard to monthly income and treatment costs the result showed that, 84% of them had insufficient monthly income, and 78% had free/ government treatment costs. In relation to residence, 72% of them were from urban

Table (2): clarifies that, the studied women present history, concerning to body mass index, it was observed that, their mean body mass index was 27.61 ± 5.52 . As regard to the chief complaint, the results showed that, 100% of them had swelling and heaviness in arm. Regarding to medical diagnosis, the results revealed that, 56% of them had right breast cancer, also; 58% of them had stage III breast cancer. Meanwhile, 66% of them were diagnosed with breast cancer since less than one year; also, the time since mastectomy was more than six months in 84% of them, while 42% of them started radiotherapy sessions since 4 weeks. In relation to dominant hand, 88% of them

were right dominant hand. Lastly as regard to lymphedema location 62% of the studied women had arm lymphedema.

Table (3): illustrates that, 12% of the studied women had satisfactory knowledge regarding breast cancer related lymphedema.

Figure (1): shows that, 26% of the studied women acquired the information about breast cancer related lymphedema from the internet.

Table (4): shows that, 8% of the studied women had adequate lymphedema self care practices.

Table (1): Number and percentage distribution of socio-demographic characteristics of the studied women (n=50).

Table (5): reveals that, there was statistically significant difference between the knowledge of the studied women and their educational level. There was highly statistically significant difference between their knowledge and their monthly income.

Table (6): illustrates that, there was statistically significant difference between the self care practices of the studied women and their educational level. There was highly statistically significant difference between their self care practices and their monthly income.

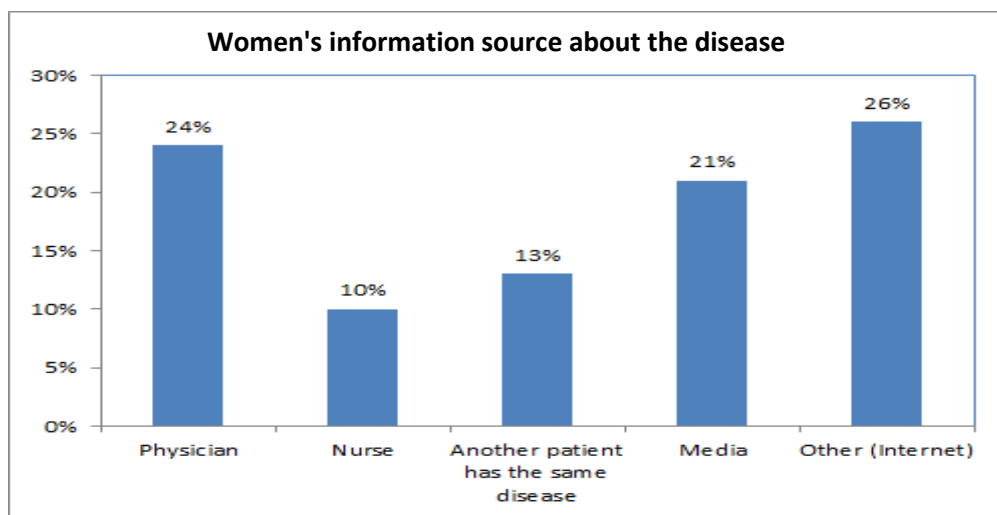
Socio-demographic data	No.	%
Age (years)		
30-<40	11	22
40-<50	23	46
≥50	16	32
Mean±SD	47.71±7.16	
Marital status		
Single	1	2
Married	43	86
Divorced	4	8
Widow	2	4
Educational level		
Can't read & write	12	24
Read and write	10	20
Middle education	19	38
High education	9	18
Occupation		
Governmental work	9	18
Private work	7	14
Housewife	31	62
On retirement	3	6
Monthly income		
Sufficient	8	16
Insufficient	42	84
Treatment costs		
Free/ Government	39	78
Private	11	22
Residence		
Urban	36	72
Rural	14	28

Table (2): Number and percentage distribution of medical health history of disease among the studied women (n= 50).

Medical health history	No.	%
Body mass index		
Normal (18 to 24.9)	12	24
Overweight (25 to 29.9)	24	48
Obese (≥ 30)	14	28
Mean \pm SD	27.61 \pm 5.52	
Chief complaint		
Severe pain in arm	26	52
Swelling in arm	50	100
Heaviness in arm	50	100
Decrease of movement in arm and shoulder	38	76
Medical diagnosis		
Left breast cancer	22	44
Right breast cancer	28	56
Breast cancer stage		
Stage I	0	0
Stage II	4	8
Stage III	29	58
Stage IV	17	34
Time since breast cancer diagnosis		
<1 year	33	66
>1 year	17	34
Time since mastectomy		
<6 months	8	16
>6 months	42	84
Mean \pm SD	6.14 \pm 2.45	
Time since starting radiotherapy sessions		
2 weeks	5	10
3 weeks	8	16
4 weeks	21	42
5 weeks	16	32
Mean \pm SD	3.5 \pm 1.4	
Dominant hand		
Left	6	12
Right	44	88
Lymphedema location		
Arm	31	62
Arm and hand	17	34
Arm and breast	2	4

Table (3): Studied women's level of total knowledge regarding breast cancer related lymphedema (n= 50).

Women's Knowledge	Satisfactory	
	No.	%
Knowledge about breast cancer	24	48
knowledge about lymphedema	8	16
knowledge about self care practices	12	24
Total knowledge	6	12

Figure (1): Studied women's information source about breast cancer related lymphedema.**Table (4):** Number and percentage distribution of studied women regarding their lymphedema self care practices (n= 50).

Self care practices	Adequate		Inadequate	
	No.	%	No.	%
General self care practices to reduce breast cancer related lymphedema	8	16	42	84
self care for skin care	6	12	44	88
self care practices of the arm in case of injury or burn	11	22	39	78
self care practices to overcome pain	6	12	44	88
self care practices about the healthy nutrition	17	34	33	66
self care practices about the safe drug use	15	30	35	70
self care practices about use of compression bandage	2	4	48	96
self care practices about general exercise	11	22	39	78
self care practices about Sexual relation (n=44)	6	13.6	38	86.4
self care practices to control the psychological pressures	9	18	41	82
Total level of lymphedema self care practices	4	8	46	92

Table (5): Relation between studied women's level of knowledge and their socio-demographic characteristics (n= 50).

Socio-demographic characteristics	Level of Knowledge				Chi-square test	
	Satisfactory		Unsatisfactory		x ²	p-value
	No.	%	No.	%		
Age (years)						
30-<40	2	33.3	9	20.5		
40-<50	2	33.3	21	47.7	0.640	0.726
≥50	2	33.3	14	31.8		
Marital Status						
Single	0	0.0	1	2.3		
Married	6	100.0	37	84.1	1.110	0.775
Divorced	0	0.0	4	9.1		
Widow	0	0.0	2	4.5		
Educational level						
Can't Read and write	0	0.0	12	27.3		
Read and write	0	0.0	10	22.7	12.010	0.007*
Middle education	2	33.3	17	38.6		
High education	4	66.7	5	11.4		
Occupation						
Governmental work	3	50.0	6	13.6		
Private work	0	0.0	7	15.9	5.401	0.145
Housewife	3	50.0	28	63.6		
On retirement	0	0.0	3	6.8		
Monthly income						
Insufficient	2	33.3	40	90.9	13.023	<0.001**
Sufficient	4	66.7	4	9.1		
Treatment costs						
Free/ Government	4	66.7	35	79.5	0.510	0.475
Private	2	33.3	9	20.5		
Residence						
Urban	5	83.3	31	70.5	0.434	0.510
Rural	1	16.7	13	29.5		
Dominant Hand						
Left	0	0.0	6	13.6	0.930	0.335
Right	6	100.0	38	86.4		

*P-value ≤ 0.05

**NS P-value > 0.05

Table (6): Relation between studied women's lymphedema self care practices and their socio-demographic characteristics (n= 50).

Socio-Demographic data	Lymphedema self care practices				Chi-square test	
	Adequate		Inadequate		x ²	p-value
	No.	%	No.	%		
Age (years)						
30-<40	1	25.0%	10	21.7%	0.875	0.646
40-<50	1	25.0%	22	47.8%		
≥50	2	50.0%	14	30.4%		
Marital Status					0.708	0.871
Single	0	0.0%	1	2.2%		
Married	4	100.0%	39	84.8%		
Divorced	0	0.0%	4	8.7%		
Widow	0	0.0%	2	4.3%		
Education level					9.954	0.019*
Can't Read and write	0	0.0%	12	26.1%		
Read and write	0	0.0%	10	21.7%		
Middle education	1	25.0%	18	39.1%		
High education	3	75.0%	6	13.0%		
Occupation					1.106	0.776
Governmental work	1	25.0%	8	17.4%		
Private work	0	0.0%	7	15.2%		
Housewife	3	75.0%	28	60.9%		
On retirement	0	0.0%	3	6.5%		
Monthly income					11.261	<0.001**
Insufficient	1	25.0%	41	89.1%		
Sufficient	3	75.0%	5	10.9%		
Treatment costs					0.023	0.880
Free/ Government	3	75.0%	36	78.3%		
Private	1	25.0%	10	21.7%		
Residence					0.019	0.889
Urban	3	75.0%	33	71.7%		
Rural	1	25.0%	13	28.3%		
Dominant Hand					0.593	0.441
Left	0	0.0%	6	13.0%		
Right	4	100.0%	40	87.0%		

*P-value ≤ 0.05

**NS P-value > 0.05

Discussion

Breast cancer related lymph-edema is a common but underreported complication of BC treatment because few studies have baseline and follow-up measurements or long-term (5 year) follow-up evaluation adequate to record the incidence accurately. Furthermore, LE has negative impact on overall QOL and

represents a financial burden for patients, caregivers, and society (Boyages et al., 2016).

Lymphedema requires life-long self care and management (Cancer Council, 2017). So, the nurse is positioned to assist the patient in meeting self care goals, management and challenges of the patient's

lifetime risk and unique trajectory of BCRL (Paula, 2015).

The present study has been designed aiming to assess the knowledge and self care practices of women with BCRL.

Regarding sociodemo-graphic characteristics of the studied women, the findings of the current study revealed that, the mean age of study group was 47.71 ± 7.16 years. This finding near to the result of the study conducted in Egypt titled "Upper limb lymphedema related to breast cancer therapy" by Saleh, Rageh, Alhassanin & Megahed (2018) who reported that the mean age of the study subjects was 48.65 ± 8.17 years.

As regards marital status, the current study stated that the majority of subjects were married; this might reflect the load that is experienced by the married women through their roles in caring of their families that result in increasing the stress on their arms which increases LE risk. This finding is similar to the results of a study about "Nurses' performance to meet satisfaction of patients undergoing breast cancer surgery" presented by Hussein (2017) who found that the majority of studied women were married.

Concerning level of education, the results of the current study revealed that more than one third of them had middle education. In contrast to the current study, Aboul-Enien, Ibrahim, Makar, Darwish & Gaber (2018) in a study about "Health-related quality of life: impact of surgery and treatment modality in breast cancer" who found that, more than one half of studied subjects couldn't read and write.

Regarding occupation, the results of the present study showed that less than two thirds of study subjects were housewives and also about one fifth of

them were in governmental work. Those women work for a long period, perform heavy physical workload, and carry heavy objects, this might indicate that, the nature of work had been caused mechanical stress on the arm and acted as a risk factor to develop LE for those women. These findings are consistent with the study conducted about "Management of breast cancer related lymphedema" by Donmez & Kapucu (2016) who stated that occupations requiring excessive use of the extremity increase BCRL risk and aggravate its symptoms.

In relation to the monthly income and treatment costs, the majority of studied women had insufficient monthly income to their lives and their treatment fees were paid by government. This results isn't consistent with study conducted in Zagazig University about "Improving quality of life for women with arm lymphedema post mastectomy" presented by Hagrass, Abd Allah, Hassan & EL Sawy, (2012); they revealed that the treatment fees were paid by most of their studied women.

Related to the residence area, the results of the current study stated that, more than two thirds of them were from urban areas. This finding agrees with the study about "Assessment of health related knowledge and practices among female patients with lymphedema post mastectomy" by Hawash (2014) who reported that the majority of women with BC came from urban areas. This finding isn't consistent with a study of Abo-Elazm et al., (2018) who conducted a cross-sectional study titled "Trends in demographics and reproductive factors in breast cancer in Egypt" and found that, slightly more than half of the studied subjects were from rural areas.

Regarding to body mass index of the studied women, the results of the

current study revealed that, less than half of them were overweight; while, more than one quarter of them were obese, and their BMI mean was 27.61 ± 5.52 . This result is supported with the study about **"Risk factors for interlimb differences among overweight breast cancer Survivors with lymphedema"** by Dean et al., (2016) who stated that; high body mass index is a risk factor for upper body BCRL onset.

Concerning women's chief complaint, it was found that, there were more than half of the studied women suffered from severe pain in arm, all of them suffered from swelling and heaviness in arm while, more than three quarters of them suffered from decrease of movement in arm and shoulder. These results are consistent with the study about **"Symptom reporting in detecting breast cancer related lymphedema"** by Fu et al., (2015) who stated that, LE symptoms include arm swelling, breast swelling, heaviness, firmness, tightness, stiffness, pain, aching, numbness, burning, stabbing, tingling, arm weakness, and limited movement in shoulder, arm, elbow, wrist/fingers.

Regarding medical diagnosis, the results of this study showed that more than half of them had right BC. This result is near to the result of a study conducted in **Cairo University** titled **"Breast cancer in women aging 35 years old and younger"** by Darwish, Helal, Aly El-din, Solaiman & Amin (2017) who found that, about half of study subjects had left BC.

As regards to BC stages, the present study stated that, more than half of the studied women had stage III BC. This result could be due to that the majority of the studied sample were not aware about breast self examination for early detection of cancer at first stage, also the majority of them were married and were not embarrassed to seek medical advice and examination and take support from their husbands, thus the BC

was discovered at stage III. In this case mastectomy usually associated with lymph nodes removal from the axilla area and could result in LE risk.

This result isn't consistent with study conducted in **Alexandria University** titled **"Effect of nursing rehabilitation program on the prevention of lymphedema among post mastectomy women"** by Hawash, Alaa Eldeen, El Shatby, El Moghazy & Hamida (2018) who mentioned that more than half of studied women were diagnosed with BC at stage II. This result is supported with the study of by Saleh et al., (2018) who concluded that, BC patients of stage IIIB who had undergone modified radical mastectomy are at higher risk for developing LE.

In relation to BC diagnosis duration, the current study showed that, about two thirds of studied women were diagnosed as BC patients since less than one year. According to this finding, **Ab-Elazm et al., (2018)** mentioned that, there are significant changes in reproductive and hormonal pattern in Egyptian females diagnosed with BC over the past 25 years and added that these trends should be taken into account when planning for any future national BC screening and prevention plans.

As Regards to LE occurrence, in the results of the present study, LE appeared on the studied women within the first 1 year after mastectomy, as mean time since mastectomy was 6.14 ± 2.45 months, while mean time since starting RT sessions was 3.5 ± 1.4 weeks; which varied from the study in **Cairo University** about **"Risk factors of upper-arm lymphedema after breast cancer treatment"** presented by Safwat, Shaalan, Mokhtar & Hamood (2017) who reported that most cases of LE in their study appeared within the first 2 years after mastectomy, as the mean time of

appearance of upper-arm LE postoperatively was 14.23 ± 13.93 months.

These might be due to the variation in diagnosis process and treatment of BC which took different time and the RT machine at the center during some period when collecting the data wasn't work, so there were variation in the time since women took RT sessions. These results are supported with **Zou et al., (2018)**, who conducted prospective cohort study about **"The incidence and risk factors of related lymphedema for breast cancer survivors"** and concluded that, BCRL is a common complication for BC patients after surgery, it can be fairly diagnosed only one month post-operation and the cumulative incidence of BCRL seems to be increasing over time, especially in the first year after surgery. Also they added that RT was found to be independent risk factor in the development of it.

Concerning to dominant hand, the results of this study showed that, the majority of them were right dominant hand. This could be interpreted by that the high percentages of the studied women were married and housewives and these might expose them to household insecticides and detergents that increase LE risk. This finding is supported by a study conducted in **Cairo University** by **Safwat et al., (2017)** who showed that there was a statistically significant association between tumor in the dominant arm with development of upper arm LE after BC treatment.

Regarding to LE location, the current study illustrated that less than two thirds of the studied women had arm LE. This goes in the same line with the finding of the study conducted by **Winch et al., (2015)** about **"Sexual concerns of women diagnosed with breast cancer related lymphedema"** who reported that a higher percentage of the studied women had arm lymphedema.

Concerning the current study question stating that "what are the knowledge and self care practices of women with BCRL?", the following is the discussion of the results related to this question.

As regards to the total knowledge of the studied women, the results of the current study showed that, the majority of the studied women had unsatisfactory knowledge about BC, BCRL and LE self care practices. This could be interpreted by that, the lack of knowledge about BCRL among health care providers, as the physician and the nurse focused on providing brief guidelines just before discharge and most of nurses didn't have knowledge about LE and its prevention and management.

This result is supported by the study presented by **Hawash et al., (2018)** who reported that overall knowledge of the study group was poor pre program. Also, **Borman, et al., (2017)** in a study about **"The importance of awareness and education in patients with breast cancer-related lymphedema"** concluded that, there is a lack of awareness of the LE or risk of LE among BC survivors, especially in developing countries.

In relation to women's information sources, the result of the present study displayed that slightly less than one quarter of the studied women's information source was the physician and media; while, more than one quarter of their information source was the internet, and the minority of them gained their information from the nurse. This might be due to lacking of information provided by health care team about BCRL. In addition, educated women could get more information sources about their condition through internet or media than uneducated women. So, I hope that LE is taken more seriously by the medical establishment.

Regarding to these findings, **Hawash et al., (2018)**, stated that after diagnosis, the primary information source about LE was a physical therapist or physicians and nurse and added that most physicians and nurses reported that they did not routinely advise women or provide written information on LE prevention to their patients, and the degree to which women's daily life was influenced.

Regarding to women's LE stages, the result of the current study illustrated that, three fifths of the studied women had stage 1 LE.

This finding comes in the same line with the result of study conducted about "**A 10 Minute Self-Care Program May Reduce Breast Cancer-Related Lymphedema: A Six-Month Prospective Longitudinal Comparative Study**" conducted by **Arinaga et al., (2016)** who found that, three fifths of the studied patients had stage 1 LE.

As regards to LE self care practices, almost of the studied women had inadequate level of LE self care practices. This could be due to lacking of knowledge regarding BCRL which affected self care practices of those women.

This result was supported by the study titled "**Self-reported information sources and perceived knowledge in individuals with lymphedema**" conducted by **Armer et al., (2013)** who mentioned that, knowledge impacts ability to carry out self-management activity, and a lack of knowledge about the mechanism of treatment and expected outcomes will inevitably affect perceived benefit of treatment.

Concerning the relation between variables under study, the result of the current study illustrated that, there was statistically significant difference between

the knowledge of the studied women and their educational level. This might be due to that educated women could acquire knowledge through reading, media, or internet.

This result was consistency with **Borman et al., (2017)** who reported that, the educated patients have a delayed progression of LE and lower stages than in patients lacking awareness of LE. Also the educated patients shortly after their surgery had higher QOL scores indicating a non-impaired wellbeing.

The result of the present study displayed that, there was highly statistically significant difference between the knowledge of the studied women and their monthly income. This might be due to that women with lower incomes can't obtain appropriate sources or knowledge about BCRL.

This result supported by the study presented by **Ngombe et al., (2014)** about "**Massive pleurisy after breast cancer surgery and early cessation of Tamoxifen: regarding an observation**" who reported that, lack of knowledge related to diagnosis and management of BCRL and financial concern impact in reducing in QOL and survivorship of BCRL patients.

The results of this study showed that, there was statistically significant difference between the self care practices of the studied women and their educational level. This indicates the importance of women education in lymphedema self care. This result was supported by the study titled "**Association between lymphedema self-care adherence and lymphedema outcomes among women with breast cancer-related lymphedema.**" conducted by **Brown, Kumar, Chevillie, Harris & Schmitz (2015)**, who mentioned that poor

or inappropriate self care as a result of insufficient patient education.

The result of the current study illustrated that, there was highly statistically difference between their self care practices and their monthly income. This result was consistent with the findings of the study conducted by Sayko, Pezzin, Yen & Nattinger (2013) about "Diagnosis and treatment of lymphedema after breast cancer: a population-based study." who reported that patients with lower income and limited social support were also at higher risk for undiagnosed lymphedema which correlate with poor lymphedema self care.

Conclusion

Based on findings of the present study, it can be concluded that:

- Majority of the studied women had unsatisfactory knowledge regarding BCRL.

- Majority of the studied women had inadequate self care practices regarding BCRL.

- In addition, there is statistically significant difference between the knowledge of the studied women and their educational level.

- Moreover there is statistically significant difference between the self care practices of the studied women and their educational level.

Recommendations

Based on the results of the current research, the following suggestions for future research and practice are proposed:

In services:

▪ Continuous in service educational programs should be held for all the health team working in breast cancer units including nursing care for women with breast cancer related lymphedema to revise, acquire and develop knowledge, performance and attitude needed to deal with such a group of patients.

▪ Assessment the factors affecting the breast cancer related lymphedema as a part of routine care of women with breast cancer in primary care to understand women's needs and concerns when experiencing this health problem.

▪ Self-care educational instructions should be added to the routine nursing care delivered to those women in all breast cancer treatment units and should be updated periodically in order to enhance their knowledge and self care practices.

▪ Education programs about lymphedema and risk reduction methods after the breast surgery are strongly needed that provide the latest information about breast cancer related lymphedema and self care approach to support breast cancer survivors to manage their disease effectively.

▪ Establish interdisciplinary approach in management of breast cancer related lymphedema at breast cancer treatment clinics.

▪ Follow up care for women with breast cancer related lymphedema through phone calls, internet and clinical visits by trained oncology nurses at breast cancer clinics should be added to the care of those women.

In researches:

▪ Further researches are recommended to assess barriers to self care among patients with breast cancer related lymphedema.

▪ Further researches are recommended periodically to be carried out on new approaches in the area of management of patients with breast cancer related lymphedema and evaluate their effect on patients' outcomes.

▪ Further research is required to study the effect of implementing the developed self-care instructions for women with breast cancer related lymphedema.

▪ Setup a project that aims to improve women's care by implementing evidence based practice at breast cancer treatment clinics.

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