Knowledge and awareness of lymphedema, its prevention and management among undergraduate students of faculty of Pharmaceutical sciences, Nnamdi Azikwe University Awka

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Abstract

Lymphedema is a set of pathologic conditions that are characterized by the regional accumulation of excessive amounts of interstitial protein-rich fluid. These occur due to an imbalance between the demand for lymphatic flow and the capacity of the lymphatic circulation. It is a deadly disease that currently has no cure, but a lot of measures can be put in place for its prevention. This study assessed the knowledge, awareness, prevention and management of lymphedema among the students of the Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Agulu Campus. A cross-sectional study was conducted among the undergraduate Pharmacy students of Nnamdi Azikiwe University, Agulu Campus using an adapted, validated questionnaire. The instrument accessed the knowledge of lymphedema, it's prevention and management amongst the students of the Faculty. The data collected was analyzed using computer-aided Software Package for Social Sciences (SPSS) version 26 and descriptive and inferential statistics were used to present the findings. Level of significance was set at p-value of <0.05. The number of students who participated was 254. Of the total, 154 (60.6%) were aware of lymphedema, and 133 (52.4%) didn't know that lymphedema can occur in other parts of the body besides the limbs. Also, 152(59.8%) believe that lymphedema can be treated, 163(64.2%) think it can be prevented and 223(87.8%) didn't know that lymphedema cannot be completely cured. This study showed that more than half of the participants were aware of lymphedema, but didn't have a comprehensive knowledge of it.

Keywords: Students, Knowledge, Lymphedema, Awareness, Prevention, Management

Introduction

Lymphedema also known as lymphatic obstruction is a set of pathologic conditions that are characterized by the regional accumulation of excessive amounts of interstitial protein-rich fluid. It is a build-up of lymph fluid in the fatty tissues just under the skin. This build-up might cause swelling and discomfort. It often happens in the arms or legs, but can also happen in the face, neck, trunk, abdomen (belly), or genitals (Sleigh & Manna, 2022). These occur as a result of an imbalance between the demand for lymphatic flow and the capacity of the lymphatic circulation (Rockson, 2021). It currently affect millions of people worldwide, however, many people are still unfamiliar with this condition and the available treatment options (Honeill, 2019). It is a problem that may occur after cancer surgery when lymph nodes are removed. It can occur months or years after treatment of cancer (Yoshiteru Akezaki *et al*., 2019). It is categorized into two major types: primary lymphedema which results due to genetic developmental abnormalities resulting in lymphatic vasculature malformation or malfunction and secondary lymphedema that is usually acquired after an injury to lymphatic vessels (Yarmohammadi *et al*., 2021). The other cause is due to a complication of cancer treatment, specifically after radiotherapy or surgery for breast cancer which puts survivors at risk for breast cancer-related lymphedema (BCRL) (Yarmohammadi et al., 2021). While in some other regions dealing with neglected tropical diseases (NTDs), the more important form of secondary lymphedema is lymphatic filariasis or podoconiosis (Yarmohammadi *et al*., 2021). Approximately 15% to 20% of cancer patients develop lymphedema following cancer treatment (Petrek *et al*., 2000). Lymphedema affects as many as 140 to 250 million people throughout the world (Mehrara *et al*., 2021), which is about 1.8 to 3.1% of the world population. Despite the great impact of lymphedema on healthcare systems worldwide, it has been neglected in medical research and education (Yarmohammadi *et al.*, 2021). Lymphedema leads to deficits in quality of life. These include the presence of pain and discomfort, the condition of the skin, and reduced mobility of the limb (Morgan *et al.*, 2005). Significant emotional and financial pain are brought on by lymphedema, both of which have a negative impact on sufferers' mental health (Eneanya *et al*., 2019).

Lymphedema is a chronic disease with no cure, and therefore, patients' adherence to current standard management including Complete Decongestive Therapy (CDT) is

essential (Dhruv Singhal, 2018). The gap in lymphedema management to some extent may be attributed to patients' lack of knowledge toward routine self-care and prevention. Patients' education has been shown to decrease the incidence and severity of lymphedema among cancer survivors, and also, community education regarding the nature of filariasis and podoconiosis has led to reduced stigmatized behaviors (Yarmohammadi *et al*., 2021). There has been a lot of research on the awareness of lymphedema over the past few decades. Little is known regarding the prevalence and incidence of secondary lymphedema caused by cancer in low and middle-income countries (Torgbenu *et al*., 2020). Few studies had been carried out in Nigeria on Lymphedema which covered the assessment of knowledge, prevention and role of social workers in lymphedema awareness, but no study had been carried out on the topic at university level in Nigeria. This study therefore assessed the knowledge and awareness of lymphedema, its management and prevention amongst the undergraduate students of Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University Awka.

Lymphedema has a lot of hidden, dangerous knock-on effects for health in the whole world with more negative effects in developing countries like Nigeria. It is a deadly disease which currently has no cure, but a lot of measures can be put in place for its prevention. Many people are ignorant of the illness, including the students in the medical line and the health workers. Previous studies have proved this and no one gives what he does not have. If the healthcare workers and the students who are future healthcare workers do not know the basic information, then the prevention and management of lymphedema among those who are in need of it will be a mirage.

In the absence of a cure for lymphedema, precautions and prevention are emphasized and this can only be given by those knowledgeable on it. Adequate knowledge of lymphedema prevention and management is needed to strengthen the knowledge base of the would-be health care staff and ensure that adequate information on lymphedema prevention and management is passed to the people who have need of it. Findings from this research will add to the existing information on the awareness of this ailment and will help to advice policy makers appropriately, possibly on including the topic in the curriculum for pharmacy, medical and para medical students.

Aim and objectives

Aim of study

To assess the knowledge, awareness and prevention of lymphedema and the various management options for lymphedema among the students of the Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Agulu Campus.

Objectives of the study

To determine the knowledge and awareness of the ailment lymphedema

To determine the knowledge of the prevention and management of lymphedema

To determine the factors that affects the knowledge of the ailment lymphedema

Conceptual review

A previous study by Alsharif (2021) on the level of awareness of lymphedema on breast cancer patients in the Kingdom of Saudi Arabia showed that in total, 95 out of 135 of participants did not know about lymphedema, 119 of the participants (88.1%) did not receive any explanation about the possibility of lymphedema from their medical team before surgery, and 121 of them (89.6%) did not receive it after surgery. The most significant factor affecting participants' level of awareness regarding breast cancer related lymphedema (BCRL) was the lack of information about the possibility of BCRL occurrence, which was not provided to them by the healthcare team (Alsharif *et al*., 2021).

Another study by Gbaghara, Chinazor Lilian (2019) on the knowledge and awareness of lymphedema on the residents of Nsukka town showed that one in five respondents (20.5%) showed that residents of Nsukka have high awareness and knowledge of the ailment slightly more than one-fourth (27.0%) showed that residents have moderate awareness and knowledge of lymphedema, and slightly more than half (52.5%) showed that residents of Nsukka have low level of awareness and knowledge of the ailment. From the results, it can be inferred that the majority of respondents (Nsukka residents) have a limited understanding of lymphedema (Gbaghara, 2019).

Another research on the role of patient awareness and knowledge in developing secondary lymphedema after breast and gynecologic Cancer Surgery where 506 female patients with upper or lower extremity lymphedema were assessed for lymphedema education. The result showed that 74 (25%) BCRL (Breast Cancer Related Lymphedema) survivors and 34 (16.83%) GCRL (Gynecologic Cancer Related Lymphedema) survivors stated that their doctors or other

primary healthcare professionals had given them information regarding lymphedema (Vural *et al.*, 2020). This shows that only few health practitioners educate their patients especially cancer patients on lymphedema.

A Survey of the Status of Awareness of Lymphedema in Breast Cancer Patients in Busan-Gyeongnam, Korea by Choi (2015) showed that eighty-one of the 116 patients answered that they had heard of lymphedema, and 30 of them (25.86%) had received explanations about its possibility before surgery. Only 20 patients (17.25%) knew that lymphedema is not a completely curable disease, 24 patients (20.68%) thought that lymphedema does not require any treatment, and only 56 patients (48.27%) knew that it is treated in the Department of Rehabilitation Medicine. The main factors that affected patients' awareness of lymphedema were their age, chemotherapy, duration of breast cancer, and lymphedema treatment history (Choi *et al.*, 2015).

Another research on clinical awareness and knowledge of breast cancer-related lymphedema among a group of psychiatrists in Turkey by Yamen (2022) showed that in total, 127 female and 44 male physiatrists completed the survey. Seventy-one percent (71%) of the participants were aged between 31 and 50 years, mostly working in metropoles and tertiary hospitals for more than 5 years. Further, 63.7% of the participants expressed that they had knowledge about BCRL; however, detailed knowledge of lymphedema treatment was low, as 67.9% of the physiatrists reported that they had no comprehensive information about complete-decongestive-therapy. Also, 87% of the participants had attended less than two educational events related to BCRL in the past 5 years. In all, 94.7% of the physicians determined a great need for education and awareness of the current literature about BCRL. In Conclusion**. t**he awareness and knowledge of lymphedema is moderate but detailed information, knowledge, and education about lymphedema and its treatment are low among those physiatrists. With the growing number of breast cancer survivors, physiatrists' awareness and education about BCRL are crucial to improve the quality of care of patients (Yaman *et al.*, 2022)

Methods

Study Area and Setting

The study was conducted in Agulu at Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Anambra State, Nigeria. Agulu is a large town located in Anaocha local

government area in Anambra state, Nigeria. It has an estimated population of 79,021 by the end of 2017 based on 2006 Nigerian census. Agulu is a semi-urban community and is home to the South-East Regional Office of NAFDAC and the Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University. Agulu town is popularly known for their lake (Agulu lake) which is one of the major tourist sites in the state (News, 2016). The state has an estimated population of 5,684,655 in 2017 based on 2006 Nigerian census. It occupies a total land area of 4,844 km^2 and a population density of 860 km^2 (Dominic C. Ndulue, 2021).

Study Design

It is a cross-sectional, descriptive intra-faculty-based survey study conducted among the undergraduate Pharmacy Students of Nnamdi Azikiwe University, Agulu Campus in Anambra state using a well-structured questionnaire. The questionnaire was adapted from a validated, self-administered, cross-sectional questionnaire used in previous studies (Gbaghara, 2019) and (Alsharif et al., 2021). It was revised based on the literature reviews above and the objectives of this work.

Study Population

The students of Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University were required to complete the self-administered questionnaires.

Sample Size Calculation:

Yamane (196 7:886) simplified formula was used to calculate the sample size and is shown below.

$n = N \div [1+N (e)^2]$.

n = Sample size

N=Total number of population

e = Margin of error

Data gotten from the class representative of each level as at April 2023

Number of students in 200 level class: 140

Number of students in 300 level class: 137

Number of students in 400 level class: 170

Number of students in 500 level class: 167

N = 140+ 137+170+167= 614 students

Thus,

$n = 614 \div [1+614 (0.05)^2]$

n = 242

A 5% of the sample size was added as overage, hence, the sample size became 254

Sampling Technique

Using proportionate sampling;

200L = (140÷ 614) × 254 = 58 students

300L = (137÷ 614) × 254 = 57 students

400L = (170÷ 614) × 254 = 70 students

500L = (167÷ 614) × 254 = 69 students

58+57+70+69= 254 students

A computerized random sampling was done to select the designated number of students in each level.

Inclusion criteria

Undergraduate students of the Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Agulu campus (200 level to 500 level) who gave verbal informed consent for participation in the study.

Exclusion criteria

The 100 Level Students of Faculty of Pharmaceutical Sciences Nnamdi Azikiwe University and Pharmacy students in Agulu who were critically ill at the time of the study.

Study Instrument

The adapted questionnaire covered questions on knowledge, attitude and perception of lymphedema. The self-administered questionnaire collected information under two cluster headings. The first included the demographics and general information data (including age, gender, level of study). The second cluster comprised knowledge, attitude and perceptions of lymphedema.

Validation of the Questionnaire

The questionnaire was English-based; and subjected to face validation by three lecturers to check for clarity and comprehension of the questions. It was then pretested for content validity, design, and reliability among 20 undergraduate students of Nnamdi Azikiwe University, Awka Campus

Ethical Consideration

Ethical approval for the study protocol was obtained from the Research and Ethics Committee of Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Anambra State. Informed consent was obtained orally from all participants before the administration of questionnaires and interviews. The participant's name or any means of identification was not in the questionnaire to ensure confidentiality.

Data Analysis

All data in the questionnaire was first entered into Microsoft Excel and then transported to

Statistical Package for Social Sciences (SPSS) version 26 for statistical analysis. In the statistical analysis, frequencies, averages, standard deviations and percentages was calculated. Chi square was used to compare their knowledge with their demographic variables. Test of significance was established at *p*-value of 0.05.

Study Duration

The study lasted for a period of four months, from April to August 2023.

Results

There was a total retrieval of all the distributed questionnaires 254 (100%). The respondents were made of males, 127 (50%) and females, 127 (50%). A greater percentage of the participants 177 (69.7%), were between 21-25 years old. The 254 (100%) participants were Christians. The rest of the demographic distribution are shown in Table 1.

Out of 254 participants, 134 (52.8%) of them had heard about lymphedema but they did not have a comprehensive knowledge about it, as only 108 (42.5%) knew that cancer surgery can increase

the risk of lymphedema occurrence and 82 (32.2%) of them knew that lymphedema is genetic. The rest of the knowledge distribution are shown in Table 2

From Table 3 below, 152 (59.8%) participants believe that lymphedema can be treated and

163 (64.2%) believe that it can be prevented, but only 31 (12.2%) knew that it cannot be completely cured.

A total of 96 (37.8%) participant believe that there are problems that hinder the delivery of the knowledge of lymphedema and management programs in Agulu. A hundred and fifty-eight, 158 (62.2%) participants believe that those factors that hinder the delivery of the knowledge of lymphedema can be ameliorated by inclusion of lymphedema in the school curriculum, creation of awareness about lymphedema by healthcare staff and education of the healthcare team. The distribution of other factors affecting their knowledge is as shown in Table 4.

Table 1: Showing the Socio Demographic Characteristics of the Study Participants

VARIABLES	**LEVES FREQUENCY (PERCENTAGE)**				**TOTAL**
SEX	**200**	**300**	**400**	**500**	
Male	29 (50)	28(49.12)	35(50)	35(49.28)	127
Female	29(50)	29(50.88)	35(50)	34(50.72)	127
AGE IN YEARS					
16-20	19 (32.8)	9 (15.8)	1 (1.4)	4 (5.8)	33
21-25	30 (51.7)	34 (58.6)	60 (85.7)	53 (76.8)	177
26-30	3 (5.20)	9 (15.8)	9 (12.9)	8 (11.6)	29
31 and above	4 (6.9)	5 (8.8)	1 (1.4)	5 (7.2)	15
RELIGION					
Christianity	58 (100)	57 (100)	70 (100)	69 (100)	254
Islam	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0
African Traditional Religion (ART)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0
Others	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0

Table 2: Participants Knowledge and Awareness of Lymphedema

	FREQUENCY/PERCENTAGE				
VARIABLES	**200L**	**300L**	**400L**	**500L**	**TOTAL**
Have you heard of Lymphedema?					
Yes	22 (37.9)	26 (45.6)	29 (41.4)	57 (82.6)	134
No	36 (62.1)	31 (54.4)	4I (58.6)	12 (17.4)	120
What do you understand Lymphedema to be?					
An infection	15 (25.9)	12 (21.1)	10 (14.3)	13 (18.9)	50
Swelling of a part or parts of the body	29 (50.0)	34 (59.6)	44 (62.9)	43 (62.3)	150
Tumor	8 (13.8)	6 (10.4)	7 (10.0)	6 (8.7)	27
Cancer	6 (10.3)	5 (8.8)	9 (12.9)	7 (10.1)	27
Do you know of anybody who has Lymphedema?					
Yes	10 (17.2)	8 (14.0)	0 (0)	9 (13.0)	27
No	48 (82.8)	49 (86.0)	70 (100)	60 (87.0)	227
If yes, what is your Relationship to the person?					
Family member	1 (1.7)	2 (3.5)	0 (0)	0 (0)	3
Friend	8 (13.8)	6 (10.5)	0 (0)	9 (13.0)	23
Colleague	1 (1.7)	0 (0)	0 (0)	0 (0)	1
Poor Hygiene can increase the risk of Lymphedema occurrence					
Yes	**20 (34.5)**	**28 (49.1)**	**18 (25.7)**	**34 (49.3)**	**100**
No	6 (10.3)	3 (5.3)	14 (20.0)	6 (8.7)	29
I don't know	32 (55.2)	26 (45.6)	38 (54.3)	29 (42.0)	125

Trauma can increase the risk of Lymphedema occurrence					
Yes	**23 (39.7)**	**28 (49.1)**	**32 (45.7)**	**35 (50.7)**	**118**
No	4 (6.9)	3 (5.3)	4 (5.7)	3 (4.3)	14
I don't know	31 (53.4)	26 (45.6)	34 (48.6)	31 (44.9)	122
Constriction of the Limb by a Bracelet or Tight Shirt can increase the risk of Lymphedema occurrence					
Yes	**29 (50)**	**27 (47.4)**	**37 (52.9)**	**55 (79.7)**	**148**
No	4 (14.3)	3 (5.2)	4 (5.7)	2 (2.9)	13
I don't know	25(43.1)	27 (47.4)	29 (41.4)	12 (17.4)	93
Overuse of the Limb can increase the risk of Lymphedema occurrence					
Yes	**17 (29.3)**	**8 (13.8)**	**12 (17.1)**	**21 (30.4)**	**58**
No	5 (8.6)	6 (10.5)	23 (32.8)	17 (24.6)	51
I don't know	36 (62.1)	43 (75.4)	35 (50.0)	31 (44.9)	145
Lymphedema occur in Other Parts of the Body other than the Limbs					
Yes	**23 (39.7)**	**24 (42.1)**	**30 (42.9)**	**44 (63.8)**	**121**
No	3 (5.2)	1 (1.7)	11 (15.7)	7 (10.1)	22
I don't know	32 (55.2)	32 (56.1)	29 (41.4)	18 (26.1)	111
Weight gain can increase the risk of Lymphedema occurrence					
Yes	**25 (43.1)**	**29 (50.9)**	**43 (61.4)**	**52 (75.3)**	**149**
No	5 (8.6)	1 (1.7)	3 (4.3)		9
I don't know	28 (48.3)	27 (47.4)	24 (34.3)	17(24.6)	96

Infection of the Skin can increase the risk of Lymphedema occurrence					
Yes	**25 (43.1)**	**23 (40.4)**	**28 (40.0)**	**38 (55.1)**	**114**
No	5 (8.6)	2 (3.5)	8 (11.4)	7(10.1)	22
I don't know	28 (48.3)	32 (56.1)	34 (48.6)	24 (34.8)	118
Cancer Surgery can increase the risk of Lymphedema occurrence					
Yes	**19 (32.8)**	**17 (29.8)**	**31 (44.3)**	**41 (59.4)**	**108**
No	4 (6.9)	2 (3.5)	4 (5.7)	4 (5.8)	14
I don't know	35 (60.3)	38 (66.7)	35 (50.0)	24 (34.8)	132
Lymphedema is Genetic					
Yes	**11 (19.0)**	**10 (17.7)**	**25 (35.7)**	**36 (52.2)**	**82**
No	13 (22.4)	13 (22.5)	14 (20)	12 (17.4)	52
I don't know	34 (58.6)	34 (59.7)	31 (44.3)	21 (30.4)	120
Does Lymphedema have any Negative Effect on the affected person?					
Yes	37 (63.8)	36 (63.2)	51 (72.9)	59 (85.5)	183
No	5 (8.6)	6 (10.5)	2 (2.9)	3 (4.3)	16
I don't know	16 (27.6)	15 (26.3)	17 (24.3)	7 (10.1)	55
If yes, what are the Effects of Lymphedema on the affected person?					
Low self esteem	4 (6.9)	2 (3.5)	7 (10.0)	9 (13.0)	22
Infection on the affected areas	3 (5.2)	5 (8.8)	5 (7.1)	7 (10.1)	20
Inability to perform daily activities	10 (17.2)	8 (14.0)	11 (15.7)	8 (11.6)	37
All of the above	20 (34.5)	21 (36.8)	28 (40.0)	35 (50.7)	104

Table 3: Participants' Knowledge on the Management and Prevention of Lymphedema

	LEVELS				
	FREQUENCY/ PERCENTAGE				
VARIABLES	**200L**	**300L**	**400L**	**500L**	**TOTAL**
Lymphedema can be Treated					
Yes	**33 (56.9)**	**28 (49.1)**	**38 (54.3)**	**53 (76.8)**	**152**
No	4 (6.9)	2 (3.5)	9 (12.9)	5 (7.2)	20
I don't know	21 (36.2)	27 (47.4)	23 (32.9)	11 (15.9)	82
Lymphedema can be Completely Cured					
Yes	12 (20.7)	12 (21.1)	19 (27.1)	27 (39.1)	70
No	**7 (12.1)**	**3 (5.2)**	**9 (12.9)**	**12 (17.4)**	**31**
I don't know	39 (67.2)	42 (73.70	42 (60.0)	30 (43.5)	153
Lymphedema can be Prevented					
Yes	**30 (51.7)**	**36 (63.2)**	**40 (57.1)**	**57 (82.6)**	**163**
No	7 (12.1)	3 (5.3)	9 (12.9)	2 (2.9)	21
I don't know	21 (36.2)	18 (31.6)	21 (30.0)	10 (14.5)	70

Table 4: Participants perception on the factors that affects the knowledge and attitude of lymphedema

	FREQUENCY/PERCENTAGE				
VARIABLES	**200L**	**300L**	**400L**	**500L**	**TOTAL**
Are there Problems that Obstruct the Delivery of Knowledge on Lymphedema and the Management					

Programs in Agulu?					
Yes	16 (27.6)	17 (29.8)	32 (45.7)	31 (44.9)	96
No	5 (8.6)	9 (15.8)	7 (10.0)	15 (21.7)	36
I don't know	37 (63.8)	31 (54.4)	31 (44.3)	23 (33.3)	122
If Yes, what are the Problems?					
Ignorance	3 (5.2)	6 (10.5)	15 (21.4)	12 (17.4)	36
Lack of knowledge and awareness of the disease	13 (22.4)	11 (19.3)	17 (24.3)	19 (27.5)	60
How can these Problems that Obstruct the Awareness and Management of Lymphedema be Ameliorated?					
Creation of awareness about lymphedema by healthcare staff	5 (8.6)	7 (12.2)	5 (7.1)	5 (7.2)	22
Education of the healthcare team	4 (6.9)	7 (12.3)	4 (5.7)	5 (7.2)	20
Sensitization program for lymphedema patients by the government	4 (6.9)	2 (3.5)	4 (5.7)	1 (1.4)	11
Provision of treatment equipment for lymphedema in hospitals	3 (5.2)	2 (3.5)	1 (1.4)	3 (4.3)	9
Inclusion in the school curriculum	3 (5.2)	14 (24.6)	11 (15.7)	5 (7.2)	33
All of the above	39 (67.2)	25 (43.9)	45 (64.3)	49 (71.0)	158

Comparison between the Participants Demographic Variables and their Knowledge and Awareness of Lymphedema, its Management and Prevention

Only 61 (24.0%) of the participants had a good knowledge of lymphedema. There is a significant relationship between their knowledge of lymphedema and level as $p<0.05$ (***p=0.03***) while there is no significant relationship between their knowledge of lymphedema and their ages and gender as $p>0.05$.

Table 5: Comparison of the Demographic Variables and Knowledge of lymphedema

GENDER	Poor knowledge	Fair knowledge	Good knowledge	P-value
Male	44(17.3%)	55(21.7%)	28(11.0%)	
Female	37(14.6%)	57(22.4%)	33(13.%)	
TOTAL	81(31.9%)	112(44.1%)	61(24.0%)	0.37
LEVEL				
200L	32(12.6%)	19(7.5%)	7(2.8%)	
300L	22(8.7%)	23(9.1%)	12(4.7%)	
400L	18(7.1%)	33(12.9%)	19(7.5%)	
500L	9(3.5%)	37(14.6%)	23(9.1%)	
TOTAL	81(31.9%)	112(44.1%)	61(24.0%)	**0.03**
AGES IN YEARS				
16-20	15(5.9%)	10(3.9%)	8(3.1%)	
21-25	57(22.4%)	81(31.9%)	39(15.4%)	
26-30	8(3.1%)	12(4.7%)	9(3.5%)	
31 and above	1(0.4%)	9(3.5%)	5(2.0%)	
TOTAL	81(31.8%)	112(44.1%)	61(24.0)	0.10

Discussion

This descriptive study assessed the knowledge, awareness and prevention of lymphedema and the various management options for lymphedema among the students of the Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Agulu Campus and revealed that 134 (52.8%) are aware of lymphedema, but only 61 (24.0%) of the participants had a good knowledge of it. A significant correlation exists between the knowledge of lymphedema and the levels of the participants, as the knowledge about the ailment increased with study level. There was no significant influence of their gender and age on the knowledge of Lymphedema. The 21-25 years of age as a group were more well

informed with better knowledge. The participant's knowledge on lymphedema was quite poor generally, as more than half of them did not know that cancer surgery, poor hygiene, obesity and infection can increase the risk of its occurrence and more than three-quarter did not know that it could be genetic. Over half of the participants believe that lymphedema could be treated/managed and prevented but very few (12.2%) knew that it cannot be completely cured. About two in every five (two-fifth) of the participants believe that there are factors that affect the awareness of lymphedema in Agulu, and these factors include ignorance and lack of knowledge about the disease. They also believe that these factors can be ameliorated by inclusion of lymphedema into the school curriculum, creation of its awareness by healthcare staff and education of the healthcare team.

According to previous studies, the level of knowledge and awareness of lymphedema ranged from low to medium (Yarmohammadi *et al*, 2021; Alsharif *et al*, 2021; Gbaghara, 2019). Limited research supports the considerable association between knowledge and prior education, and practically all the previous studies indicated an educational intervention (Yarmohammadi *et al*., 2021). Our finding from this study showed that slightly above half of the participants were aware of lymphedema. A similar study conducted on 116 women with breast cancer regarding their level of awareness of breast cancer related lymphedema (BCRL) by Choi (2015), revealed that a little more than half of the participants were aware of it as a diseases (Choi *et al.*, 2015). But contrary to this finding, a study on the awareness and knowledge of lymphedema amongst breast cancer participants revealed that the level of information provided to the participants was inadequate. Only 19.5% of the participants reported being aware of lymphedema, and 80.5% were neither informed nor educated on BCRL (Alsharif *et al*., 2021). As a result, the study revealed that the chance of developing lymphedema is higher in individuals who do not get lymphedema information following surgery compared to those who do (Alsharif *et al*., 2021).

Although a little above half of the participants were aware of lymphedema, only a quarter of the participants had good knowledge of lymphedema. A similar study by Sultan Ozkan (2021) on Nurses' knowledge level on lymphedema revealed that the knowledge level of Nurses on lymphedema was below the average (Özkan, 2021). A Nigerian study by Gbaghara, Chinazor Lilian (2019) on the

knowledge and awareness of lymphedema on the residents of Nsukka town showed that four in five respondents (79.5%) showed that residents of Nsukka have low knowledge of lymphedema (Gbaghara, 2019). Likewise, a previous systematic review was done in four different countries (Canada, United Kingdom, United States, and Japan) on breast cancer related lymphedema. It found that the majority of participants with breast cancer had a significant lack of information regarding BCRL, and the reason behind it was that the health care providers did not have enough knowledge regarding BCRL (Conway, 2016). Similar to our study, the students in medical line have little knowledge about lymphedema, which is why education intervention is needed. More than half of the participants from this study knew that lymphedema can be managed/treated and prevented. A similar study was conducted on the knowledge of the preventive measures of lymphedema in Bialystok, Poland (2014). The participants indicated a high degree of knowledge of lymphedema prevention (Kulesza-Bronczyk B *et al*., 2014). The study found that assessing quality of life should be a crucial component of rehabilitation for all patients, particularly those with breast cancer, because mastectomies have an impact on the outcome during the postoperative period (Kulesza-Bronczyk B *et al*., 2014)**.** Contrary to this finding, a study by Yaman (2022), revealed that extensive understanding of lymphedema treatment was lacking as more than half of the participants had no comprehensive knowledge of complete-decongestive-therapy (Yaman *et al.*, 2022).

Less than a quarter of the participants of this study knew that lymphedema cannot be completely cured. A similar study by Choi et al 2015 showed that only 17.25% of the participants knew that lymphedema is not a completely curable disease (Choi *et al*., 2015).

This study revealed that there are factors that affect the knowledge of lymphedema which include ignorance and lack of awareness for lymphedema. A similar study by CollinsBohler (2012) revealed that Ignorance is a major problem that affect the knowledge of lymphedema (Collins-Bohler, 2012). Contrary to this finding, a study was published in Business at Kaiser Permanente Northern California (2012). The findings of which suggest that lymphedema knowledge and awareness differed based on the age of the breast cancer patients (Kwan *et al*., 2012). Also a research conducted by Paskett and Stark (2006), revealed that clinicians do not frequently counsel breast cancer patients on BCRL due to misconceptions about the

disease's occurrence and prevention techniques. Even when patients informed their providers about BCRL symptoms, there was little concern or action taken (Yaman *et al*., 2022). And this affects the awareness and knowledge of lymphedema negatively.

This study was saddled with some limitations such as the possibility of the respondents being evasive and not completely truthful with their response. However, this study has given an insight on the level of knowledge and awareness of lymphedema amongst the students of Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University (NAU) Awka. More studies on this topic should be carried among the lecturers in NAU and among the students and lecturers in other institutions in Southeastern Nigeria and other geo-political zones in the country. The outcomes will provide an idea of interventions to fill the knowledge gap ranging from inclusion in the curriculum for pharmacy, medical and paramedical students and adequate training and provision of study materials to the lecturers. Education of the general public on the subject matter should also be increased through mass media campaigns and online tools.

Conflict of interest

The authors declare no conflict of interest.

Conclusion

This study showed that a greater number of the participants are aware of lymphedema, but did not have a comprehensive knowledge of it. Only 61 (24.0%) of the participants had a good knowledge of lymphedema. Many of the participants did not know that lymphedema is genetic and could occur in other parts of the body other than the limbs. Though a greater percentage of the participants knew that lymphedema could be treated and prevented, they did not know that it cannot be completely cured. This study revealed that there are hindrances to the adequate knowledge of lymphedema among the participants which include; ignorance and lack of awareness of the disease state. There was a significant relationship between the knowledge of lymphedema and the study level of participants, their knowledge of lymphedema increased as their level of study increased.

Lymphedema is a relatively unknown condition that can have a significant impact on a person's quality of life. Awareness of lymphedema is still lacking, both among the general public and in the medical community. It is very important for those in medical line

to be aware of lymphedema to enable the provision of accurate information and appropriate referrals for treatment as the need arises.

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