

Knowledge of Undergraduate Pharmacy Students at Suez Canal University about Breast Cancer: A Cross-Sectional Study

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ABSTRACT

Background: Breast cancer is the most diagnosed cancer in women, worldwide and in Egypt. Breast cancer awareness interventions are effective. Increasing awareness can decrease both late diagnosis and mortality rates. Because pharmacists are trusted, and accessible by the public, they can participate in breast cancer awareness. This requires having knowledge about its signs and symptoms, risk factors and the best time for screening.

Objective: To determine the knowledge about breast cancer signs and symptoms, risk factors, and best time for screening, among undergraduate pharmacy students at Suez Canal University.

Population and Methods: this descriptive cross-sectional study was conducted at Faculty of Pharmacy, Suez Canal University, Ismailia, Egypt, among male and female, clinical and general, undergraduate pharmacy students. An online questionnaire was answered by 429 students, between 10/7/2024 and 24/7/2024.

Results: The overall total knowledge levels for all participants were good. Female students showed better levels than male students, although the difference was statistically insignificant (p- value =0.05). Being a general or a clinical pharmacy student did not show statistically significant difference (p- value =0.231). There was a statistically significant difference (p- value =0.014) among different academic years, with the highest levels being among the 5th year students.

Conclusion: The overall total knowledge levels for all participants were good, especially the knowledge about the signs and symptoms, and the risk factors of breast cancer. Participants' knowledge levels about breast cancer best time for screening are distributed relatively closely across good, average, and poor categories, with no single group dominating the others.

Keywords: Awareness, Breast cancer, Knowledge, Pharmacy students.

INTRODUCTION

Breast cancer is the most commonly diagnosed cancer in women, and the fourth leading cause of cancer death, globally. In Egypt, it is the most prevalent malignancy among females. It is also the second leading cause of cancer mortality among all people of all ages in 2022 ⁽¹⁾. Early detection of breast cancer can significantly improve treatment outcomes. When diagnosed at an early stage, it has a better chance of successful treatment ⁽²⁾. Achieving early detection requires awareness of breast cancer. Public, especially women, should know the common symptoms of breast cancer ⁽³⁾. Because healthcare professionals are trustworthy information sources ⁽⁴⁾, they can make a difference in the health of people at risk of cancer ⁽⁵⁾. To achieve this, they must be well-trained, and well-educated about breast cancer ⁽⁴⁾. Among those healthcare professionals, who should be well-trained and educated, are pharmacists. Pharmacists are trusted and more accessible by the public, with agreeable degrees of comfort, especially with females ⁽⁶⁾. But there are not enough studies about knowledge of community pharmacists on screening recommendations or cancer signs and symptoms ⁽⁷⁾.

AIM OF THE STUDY

To assess the level of knowledge regarding breast cancer signs and symptoms, associated risk factors, and

the optimal time for screening among undergraduate pharmacy students at Suez Canal University.

METHODOLOGY

Study Design

This is a descriptive cross-sectional study.

Eligibility criteria

The inclusion criteria included male and female, aged ≥ 18 years, clinical pharmacy (CP) and general pharmacy (GP), undergraduate students at Faculty of Pharmacy, Suez Canal university. The term undergraduate includes bachelor programs (BS).

Sampling technique and sample size

Sampling was done via non-probability, convenience sampling technique. Sample size was initially calculated to be 384, using a 95% confidence interval and a 5% margin of error, with a 50% response rate assumption. 429 students participated in the study, exceeding expectations ⁽⁸⁾.

Study Tool

A self-administered online questionnaire, in English, through a Google form link distributed on students' WhatsApp groups. The questionnaire was constructed and validated in a previous study ⁽⁹⁾, covering the following items:

- 1) Socio-demographics (age, gender, department, and academic year).

- 2) Source of information (if the student has any information).
- 3) Knowledge of breast cancer signs and symptoms. This part was assessed using National Health Service (NHS) ⁽¹⁰⁾, Centers for Disease Control and Prevention (CDC) ⁽¹¹⁾ and World Health Organization (WHO) ⁽¹²⁾.
- 4) Knowledge of breast cancer risk factors. This part was assessed using CDC ⁽¹³⁾, WHO ⁽¹²⁾, the American Cancer Society guideline for diet and physical activity for cancer prevention ⁽¹⁴⁾.
- 5) Knowledge of the best time for screening. This part was assessed using the American College of Obstetricians and Gynecologists practice bulletin clinical management guidelines (breast cancer risk assessment and screening in average-risk women) ⁽¹⁵⁾.

Data Management and Statistical Analysis

Data were collected using Google form. Data entry was done using Statistical Package for Social Sciences (IBM SPSS) version 22. The percentage of achieved score of the total knowledge score was calculated. Poor knowledge was set to be up to <50%, while average was set to range from $\geq 50\%$ and <75% and good was set to be $\geq 75\%$. Categorical variables were presented as frequencies and percentages, while numerical variables were presented as means, standard deviations (SD), and range. Chi-square test and Fisher's exact test were applied to assess the association between categorical variables. Comparisons within groups were conducted according to gender, department, and academic year. Significance was considered at p-value of < 0.05.

Ethical Consideration

The study was approved by the Ethical Review Committee at Faculty of Medicine, Suez Canal University (Approval No. 5635, 23 Jan 2024). The administrative approval from the dean of Faculty of Pharmacy, Suez Canal University, was obtained. Participation was voluntary, and informed consent was obtained from all participants before data collection. The Helsinki Declaration was followed throughout the study's conduct.

RESULTS

Characteristics of Study Participants

Participants in this study aged between 18 and 28 years. The mean age of participants was 20.7 years. Out of the 429 participants who completed the questionnaire, 71.6% were females. About 59% of the study participants were GP students.

The highest percentage of participants were fifth year students (32.9% of the participants). The socio-demographic characteristics of participants are demonstrated in table 1.

Table 1. The socio-demographic characteristics of participants (n=429)

Characteristics		Frequency	
		N	%
Age	18 - <20	113	26.3
	20 - <22	155	36.1
	22 - <24	159	37.1
	≥ 24	2	0.5
	Mean $\pm$ SD	20.7 $\pm$ 1.4382	
Gender	Male	122	28.4
	Female	307	71.6
Department	GP	253	59
	CP	176	41
Academic Year	1	6	1.4
	2	134	31.2
	3	56	13.1
	4	92	21.4
	5	141	32.9

Sources of information

Source(s) of information question was not an obligatory question to answer, allowing those participants with no previous knowledge of breast cancer to skip the question. In case of skipping the question, the participant was considered to have no knowledge about breast cancer. Participants who answered with one or more answers were considered to have some knowledge about breast cancer. Out of 429 participants who submitted fully answered questionnaire, 15 participants skipped the source(s) of information question, while 414 participants gave one or more answers. The most common source of information was the internet. 74.9% of participants with previous knowledge had their all or part of their knowledge from the internet. University education was a source of information for 39.6% of the participants. Table 2 shows participants' sources of information.

Table 2. Participants responses to the source of their information (n=414)

	Frequency of the source	
	N	%
University education	164	39.6
Television and media	82	19.8
Family and friends	69	16.67
Medical Journals	46	11.1
Internet	310	74.9
Awareness campaigns	123	29.7

Knowledge about Signs and Symptoms

The most recognized sign of breast cancer was the presence of painless and palpable breast lump (76.9%). 76.2% of the participants had good levels of knowledge (Table 3). Female participants showed insignificantly higher participation and better knowledge regarding signs and symptoms of breast cancer compared to male participants (56.2% and 20%, had good knowledge, respectively). GP students also had insignificantly better knowledge than CP students (45% and 31.23% had good knowledge, respectively). However, the difference was significant among different academic years, 25.17% of participants were 5th year students with good levels of knowledge of breast cancer signs and symptoms.

Table 3. Level of knowledge of signs and symptoms (n=429)

		Poor		Moderate		Good		Tests value	P-value
		N	%	N	%	N	%		
Gender	Male	6	1.4	30	7	86	20	3.132 ^a	0.209
	Female	12	2.8	54	12.6	241	56.2		
Department	GP	11	2.56	49	11.42	193	45	0.049 ^a	0.976
	CP	7	1.63	35	8.16	134	31.23		
Academic Year	1	2	0.5	3	0.7	1	0.23	24.972 ^b	0.001
	2	6	1.4	34	7.9	94	21.9		
	3	3	0.7	11	2.56	42	9.8		
	4	1	0.23	9	2.1	82	19.11		
	5	6	1.4	27	6.3	108	25.17		
a. Chi square test (X ²)						b. Fisher's exact test			

Knowledge about Risk Factors

There was a consensus among 77.2% of the participants that being overweight and obese is a risk factor of breast cancer. 67.4% of the participants had good levels of knowledge (Table 4).

Female participants showed higher participation and better knowledge regarding risk factors of breast cancer compared to male participants (50.11% and 17.25% had good knowledge, respectively), however, the difference was not significant. GP students also had insignificantly better knowledge than CP students (40.33% and 27.03%, had good knowledge, respectively). However, the difference was significant among different academic years, 24.01% of participants were 5th year students with good levels of knowledge of breast cancer risk factors.

Table 4. Level of knowledge of risk factors (n=429)

		Poor		Moderate		Good		Tests value	P-value
		N	%	N	%	N	%		
Gender	Male	5	1.17	43	10.02	74	17.25	4.798	0.091
	Female	5	1.17	87	20.28	215	50.11		
Department	GP	5	1.17	75	17.48	173	40.33	0.515	0.773
	CP	5	1.17	55	12.82	116	27.03		
Academic Year	1	1	0.23	4	0.94	1	0.23	20.88 ^b	0.004
	2	4	0.94	51	11.9	79	18.41		
	3	3	0.7	16	3.73	37	8.62		
	4	1	0.23	22	5.13	69	16.08		
	5	1	0.23	37	8.62	103	24.01		
a. Chi square test						b. Fisher's exact test			

Knowledge about Best Time for Screening

Participants' level of knowledge of the best time for screening for breast cancer was 39.6% good (Table 5).

Female participants showed significantly higher participation and better knowledge regarding the best time for screening for breast cancer compared to male participants (31% and 8.62%, had good knowledge, respectively). However, GP students had insignificantly better knowledge than CP students (23.08% and 16.55%, had good knowledge, respectively). Among different academic years, 2nd year students also, had slightly better levels (12.82%) of knowledge than 5th year students (12.59%).

Table 5. Level of knowledge of the best time for screening (n=429)

		Poor		Moderate		Good		X ²	P-value
		N	%	N	%	N	%		
Gender	Male	42	9.79	43	10.02	37	8.62	10.244	0.006
	Female	64	14.92	110	25.64	133	31		
Department	GP	57	13.29	97	22.61	99	23.08	2.461	0.292
	CP	49	11.42	56	13.05	71	16.55		
Academic Year	1	1	0.23	2	0.47	3	0.7	2.476	0.963
	2	37	8.62	42	9.79	55	12.82		
	3	13	3.03	20	4.66	23	5.36		
	4	23	5.36	34	7.93	35	8.16		
	5	32	7.46	55	12.82	54	12.59		

Total Knowledge

Participants' level of total knowledge of breast cancer was found to be 68.3% good (Table 6).

Female participants showed insignificantly higher participation and better total knowledge of breast cancer than male participants (51.3% and 17%, had good knowledge, respectively). GP students also had insignificantly better knowledge than CP students (40.8% and 27.5%, had good knowledge, respectively). Among different academic years, participants of 5th year students (24%) had significantly better levels of total knowledge of breast cancer.

Table 6. Level of total knowledge of breast cancer (n=429)

		Poor		Moderate		Good		X ²	P-value
		N	%	N	%	N	%		
Gender	Male	6	1.4	43	10	73	17	5.996	0.05
	Female	8	1.9	79	18.4	220	51.3		
Department	GP	7	1.63	71	16.55	175	40.8	0.565	0.754
	CP	7	1.63	51	11.89	118	27.5		
Academic Year	1	0	0	5	1.17	1	0.2	19.093	0.014
	2	7	1.63	45	10.5	82	19.11		
	3	2	0.47	18	4.2	36	8.4		
	4	3	0.7	18	4.2	71	16.55		
	5	2	0.47	36	8.4	103	24		

DISCUSSION

Our study was a cross-sectional study, aimed at determining the knowledge of undergraduate pharmacy students about breast cancer signs and symptoms, risk factors, and screening methods to promote their involvement in its health promotion.

There were limited number of studies conducted to evaluate the knowledge of undergraduate pharmacy students about breast cancer ⁽¹⁶⁻¹⁸⁾. Two studies, one conducted among pharmacy and physiotherapy students at Medical University Nawbshah, and the other among Near East University (NEU) and Cyprus International University (CIU) pharmacy students, had results similar to ours, that most of pharmacy students had a good knowledge about breast cancer, although this knowledge remains insufficient in the fight against breast cancer ^(17,18). Unlike our study, a study was conducted on the same subject, among female pharmacy students of Suleyman Demirel University, showed that pharmacy students had a fair knowledge level about breast cancer ⁽¹⁶⁾. In our study, 68.3% of the participants had good total knowledge about breast cancer, including knowledge about signs and symptoms, risk factors, and the best time for screening. The gender did not have a significant impact on the level of knowledge (p-value = 0.05), although females had better total knowledge than males. On the contrary, the academic year had a significant impact on the level of knowledge (p-value = 0.014), where the final year participants had better knowledge than all the other years. In the study conducted in both NEU and CIU, 59.8% of NEU pharmacy students had good knowledge of breast cancer, compared to 71.3% of CIU pharmacy students, who had good knowledge of breast cancer. These results were consistent with our results ⁽¹⁷⁾.

In the same context, the study found a statistically significant association between gender and breast

cancer knowledge, for both NEU pharmacy students (p-value = 0.002), and CIU pharmacy students (p-value = 0.028). Also, statistically significant association between class and breast cancer knowledge was found, for both NEU pharmacy students (p-value = 0.009), and CIU pharmacy students (p-value = 0.0001) ⁽¹⁷⁾. This assessment did not include the knowledge of the best time for screening.

In a different context, the study conducted among female pharmacy students by **Albayrak et al.** ⁽¹⁶⁾, there was no evaluation of the level of total knowledge. The evaluated level of knowledge was for the risk factors and symptoms, separately. Since the study was conducted among female students only, the study did not assess the gender impact on the level of knowledge of breast cancer. Yet, the study evaluated the association between the academic year and the level of knowledge of breast cancer risk factors and symptoms and found no statistical significance (p-value > 0.05).

The difference in the results between our study and **Albayrak et al.** ⁽¹⁶⁾ study was attributed to their beliefs that breast cancer was not mentioned in any of the courses at the faculty. The curriculum at Faculty of Pharmacy, Suez Canal University, does not directly educate students about breast cancer. However, it has topics related to breast cancer treatments in both medicinal chemistry and pharmacology, which are more drug related than symptoms or risk factors related. This may have encouraged the students to search more about breast cancer itself, and thus have more, yet still not highly sufficient knowledge about breast cancer. Also, 5th year students, clinical students, have an oncology part in their curriculum before graduation, that they have in corporation with Faculty of Medicine, Suez Canal University.

In our study, the internet was the most common information source for participants, either alone

(24.9%) or combined with other sources (74.9%). The medical journals were not a single source for any of the participants but were combined with other sources for about 11.1% of the participants, representing the least used source of information. These results were contradictory from the Suleyman Demirel University study, where medical websites were the most used source, for about 29.5% of the participants, followed by social media, for about 27% of the participants ⁽¹⁶⁾. Both studies conducted in medical university Nawabshah, and Northern Cyprus universities did not discuss the sources of information of the participants ^(17,18).

CONCLUSION

The overall total knowledge levels for all participants were good, especially the knowledge about the signs and symptoms, and the risk factors of breast cancer. The gap in knowledge about the best time for breast cancer screening was narrow among participants.

RECOMMENDATIONS

- 1) Evaluating, enriching, and updating the curriculum of Faculty of Pharmacy, Suez Canal University, about breast cancer, especially about its screening recommendations.
- 2) Encouraging students to participate in workshops about breast cancer.
- 3) The Egyptian Pharmacists syndicate orchestrate awareness campaigns aiming at raising the awareness among freshly graduated pharmacists, of their role in prevention of breast cancer.
- 4) The Ministry of Health conducts workshops and awareness campaigns targeting freshly graduated pharmacists, about the most common health problems among the population, including breast cancer.

LIMITATIONS

- Representation of the students in all 5 grades was not achieved because of method of data collection.
- Generalization of the current results could not be achieved because of the non-probability sampling technique.
- Further studies should be conducted to enrich the students with main knowledge about important health problems in their communities.

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