Awareness of Breast Cancer Risk Factors and Practice of Breast Self-Examination Among Nursing Students

Mona H. Afifi

Assistant Professor - Medical-Surgical Nursing, King Saud Bin Abdul Aziz University for Health Science (KSAU), College of Nursing-Riyadh (CON-R)
e-mail: afifim@ksau-hs.edu.sa

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ABSTRACT

Contents: Breast cancer is the most common cancer in women of both developed and less developed world. Breast cancer is a common malignancy among Saudi females, with a prevalence of 21.8%. Awareness of risk factors and practice of breast self-examination still has a significant role in the early detection effort of breast cancer, particularly in young women.

Aim: of this study is to explore the awareness of breast cancer risk factors and the reported practice of breast self-examination among nursing students in the King Saud bin Abdulaziz University for Health Sciences -College of Nursing (CON-R), Kingdome of Saudi Arabia.

Methods: A descriptive cross-sectional correlational design was utilized in this study on a convenience sample of 373 nursing students in King Saud bin Abdulaziz University for Health Sciences, College of Nursing (CON-R). The study used two tools. The first tool is a structured interview questionnaire designed by the researcher to collect data about the students' characteristics and to assess the student nurses' awareness of breast cancer risk factors. The second tool is a breast self-examination practice form that is designed to assess the student nurses' reported practice of breast self-examination.

Results: The results of the present study show that 60.6% of the nursing students' age was between 20-24 years; 18.2 % of them had a positive family history of breast cancer. The nursing student higher awareness was revealed for risk factors of female gender (4.5±0.7), age more than 40 (4.3±0.8), positive family history (4.2±0.8), breast disease (4.1±0.8). Average awareness was revealed for risk factors of late menopause (2.8±1.8), and physical inactivity (3.0±1.1). 63.5% of students did not practice breast self-examination; among the remaining only 25.5% practicing monthly, only 5% was regularly practicing, while 31.1% of them did not practice regularly.

Conclusion: The nursing students reveal a good awareness of most of the breast cancer risk factors. Despite a good awareness level, they reported that about two-thirds of students did not practice breast self-examination. The study recommended the conduction of awareness campaigns in all university campus who are encompassing female students to enhance their awareness of breast cancer risk factors and promote their practice of breast self-examination.

Keywords: Awareness, breast cancer, risk factors, breast self-examination, nursing students.

1Introduction

Breast cancer is the most common cancer in women of both developed and less developed world. It is estimated worldwide that over 627,000 women died in 2018 due to breast cancer *(WHO, 2020b).* Although breast cancer is thought to be a disease of the developed world, almost 50% of breast cancer cases and 58% of deaths occur in less developed countries *(GLOBOCAN, 2008).* Incidence rates vary greatly worldwide from 19.3 per 100,000 women in Eastern Africa to 89.7 per 100,000 women in Western Europe. In most of the developing regions, the incidence rates are below 40 per 100,000 *(GLOBOCAN 2008; WHO, 2020a).*

Breast cancer survival rates vary greatly worldwide, ranging from 80% or over in North America, Sweden, and Japan to around 60% in middle-income countries and below 40% in low-income countries *(Coleman et al., 2008).* The low survival rates in less developed countries can be explained mainly by the lack of early detection programs, resulting in a high proportion of women presenting with late-stage disease, as well as by the lack of adequate diagnosis and treatment facilities *(WHO, 2020).*

Breast cancer is a common malignancy among Saudi females, with a prevalence of 21.8%. The most recent survey of cancer-related mortality among Saudi women finds that breast cancer is the ninth leading cause of death *(Mokdad et al., 2014). Al-Qahtani (2007)* reported that breast cancer is the second most common malignancy in Saudi women. *Ibrahim et al. (2008)* predict that breast cancer rates in Saudi Arabia will increase over the next few decades as the population grows and ages. According to the Saudi Cancer Registry of the King Faisal Specialist Hospital and Research Centre, around 930 new cases of breast cancer are diagnosed each year in Saudi Arabia. In 2010, out of 5,378 cancer diagnoses in Saudi Arabia, 1,473 (27.4%) were for breast cancer, making it the most common newly diagnosed cancer among women *(Alotaibi et al., 2018).*

Young women's cancers are generally more aggressive and result in lower survival rates, making early detection even more important. Young breast cancer patients have a lower rate of survival than old breast cancer patients due to being diagnosed at advanced stages *(Karayurt et al., 2008).*

[1]*Corresponding author: Mona Hamdi Afifi*

The adolescent period is a time of rapid change that provides teaching opportunities for shaping health behaviors into adulthood. Promotion of self-care, an attitude fostered early in life, may pay lifelong dividends *(Ludwick & Gaczkowski, 2001).*

Several risk factors for breast cancer have been well documented. A familial history of breast cancer increases the risk by a factor of two or three. Some mutations, particularly in BRCA1, BRCA2, and p53, resulting in a very high risk for breast cancer. Reproductive factors associated with prolonged exposure to endogenous estrogens, such as early menarche, late menopause, late age at first childbirth are among the most important risk factors for breast cancer. Exogenous hormones also exert a higher risk of breast cancer. Oral contraceptive and hormone replacement therapy users are at higher risk than non-users. Breastfeeding has a protective effect *(International Agency for Research in Cancer IARC, 2008; Lacey et al., 2009).* Therefore, early detection in order to improve breast cancer outcome and survival remains the cornerstone of breast cancer control *(Anderson et al., 2008).*

There is no evidence on the effect of screening through breast self-examination (BSE). However, the practice of BSE has been seen to empower women, taking responsibility for their health. Therefore, BSE is recommended for raising awareness among women at risk rather than as a screening method *(WHO, 2020).* BSE is recommended because it is free, private, painless, easy, safe, and requires no specific equipment. It has also been shown to improve breast health awareness and thus potentially allow for early detection of breast anomalies *(Nde et al., 2015; Suh et al., 2012; Azage et al., 2013; Ginseng et al., 2012).* The American Cancer Society also recommends that women from the age of 20 years onwards should be educated on the benefits of performing BSE monthly *(The American Cancer Society, 2014).*

It had been demonstrated that factors related to women´s awareness, knowledge and perceptions about breast cancer might contribute significantly to medical help-seeking behaviors *(Okobia et al., 2006; Oladimeji, 2015; Hadi et al., 2010; Sama et al., 2017).*

2. Significance of the Study

Breast cancer is a common malignancy among Saudi females. It ranked first among all types of cancer among 33,554,333 millions of population. *WHO (2019)* reported 3629 (29.7%) new cases of breast cancer among females of all ages. With a reported cumulative mortality risk of 899 cases, which ranked as the second cause of mortality from cancer. WHO in 2018 also reported a five-year prevalence of all ages as 12,313 with a proportion of 85.85 *(WHO, 2019).*

Awareness of risk factors and practice of breast self-examination still has a significant role in the early detection effort of breast cancer, particularly in young women. So, this study conducted to investigate the awareness of female student nurses of breast cancer risk factors and their practice of breast self-examination among nursing students in King Saud bin Abdulaziz University for Health Sciences -College of Nursing (CON-R).

3. Aim of the study

Explore the awareness of breast cancer risk factors and the reported practice of breast self-examination among nursing students in the King Saud bin Abdulaziz University for Health Sciences -College of Nursing (CON-R).

3.1. Research questions

- What is the awareness level for breast cancer risk factors among nursing students?
- What is the reported practice of breast self-examination among nursing students?
- Is there a relationship between students' academic level and level of awareness of breast cancer risk factors?
- Is there is a relationship between the student's family history of breast cancer and their level of awareness?
- Is there is a relationship between the student's family history of breast cancer and their practice of breast self-examination?

4. Subjects and Methods

4.1. Research design

A descriptive cross-sectional correlational design was utilized in this study. Descriptive cross-sectional research is research designed to provide a snapshot of the current state of affairs. Correlational research is the research designed to discover relationships among variables and to allow the prediction of future events from present knowledge *(Walinga & Stangor, 2012).*

4.2. Research setting

The study conducted at King Saud bin Abdulaziz University for Health Sciences -College of Nursing (CON-R). the data collected in the classroom of each academic level. The capacity of each class is between 25 to 100 students.

4.3. Subjects

A convenience sample of 373 nursing students in King Saud bin Abdulaziz University for Health Sciences College of Nursing (CON-R) during the academic year 2012-2013 from different academic levels.

4.4. Tools of the study

The researcher developed the study tools based *on Nde et al. (2015); Suh et al., (2012); Azage et al., (2013); Lemlem et al., (2013).*

4.4.1. Structured Interview Questionnaire

It aimed to assess the students' sociodemographic characteristics. It included two parts. The first part is concerned with students' data such as age, academic level, height, and weight (BMI), and family history of breast cancer.

The second part was a five-point Likert scale. It ranged from strongly agree to strongly disagree. It designed to

assess the students' awareness of breast cancer risk factors. It included 16 risk factors such as gender (2 questions), age (2 questions), family history, early onset of menarche, late onset of menopause, having the first child after 35 years of age, breast disease, dense breast tissue, physical inactivity, fatty foods, breastfeeding, obesity, smoking, stress, using contraceptive pills, and wearing a soft bra.

The scoring system ranged between 5 for strongly agree to one for strongly disagree. The non-risk factor got a reversed score. A mean score for each factor was calculated and presented, with the high mean score indicate higher awareness of each risk factor. It was classified as following: <1.65 was considered low awareness of the risk factor, 1.65-<3.3 was considered average awareness, and 3.3-5 was considered good awareness.

The total score of answers was computed into (18 questions multiplied by 5= 90) and classified into three categories: Poor; less than 50; fair; 50-to less than 70 and Good; is 70 and above.

4.4.2. Breast Self-Examination Practice Form

It aimed to assess the self-reported practice of breast self-examination. It included four closed-end questions regarding performing breast self-examination, the frequency of performing, regularity, and timing. It tabulated as numbers and percentage for the student responses

4.5. Procedures

The researcher developed the study questionnaires, and subject it to a panel of five experts in the Medical-Surgical Nursing to reveal the tool content validity. No modification was done. Tool reliability was assessed using the Cronbach alpha test. It was 0.75 for the structured interview questionnaire and 0.65 for the breast self-examination practice form. Official request provided to the dean of the Faculty of Health Science Collage of Nursing, King Abdulaziz University, including the study aim and procedures, for obtaining approval to conduct this study.

The pilot study was conducted on 10% of the study sample to assess the feasibility of the research process. The pilot sample was included in the primary sample.

The data was collected from the nurse students at the beginning of their scheduled lecture after getting approval from their assigned instructor and written approval from them as well. The completion of the research instrument took an average of 10 minutes. The data collection process took one month to be completed

4.6. Data analysis:

Data from the questionnaires were entered and analyzed using statistical package for the social sciences (SPSS Inc., Chicago, IL) version 20.0. Continuous variables presented as means and standard deviations (SD) and categorical variables presented as numbers and percentages. A Chi-square test was used to find the relationship between categorical variables, correlation coefficient test used to measure the strength of the relationship between two variables. The level of significance is considered at $p \leq 0.05$.

5. Results

Table 1 shows that 60.6% of the nursing students' age was between 20-24 years, and 35.4% were less than 20 years of age with a mean age of 20.58±2.04. 21.4% of them were in first academic level, 60.1% of them had normal body weight while 21.7% of them were overweight, and 7% were obese. 18.2% of them had a positive family history of breast cancer.

Table 2 indicates that the nursing student awareness was good for risk factors of female gender (4.5±0.7), age more than 40 (4.3±0.8), positive family history (4.2±0.8), breast disease (4.1±0.8), early onset of menarche (3.3±1.0), male gender (3.3±1.2), breastfeeding (3.3±1.4), having the first child after 35 years of age (3.4±1.0), fatty foods (3.5±1.0), using contraceptive pills (3.6±0.9), stress (3.6±1.0), and obesity (3.7±1.0). An average awareness was for risk factors of age below 40 (2.6±1.0), late menopause (2.8±1.8), and physical inactivity (3.0±1.1), wearing a soft bra (3.2±1.1).

Figure 1 illustrates the total awareness score. It reveals that 77.70% of nursing students had a fair awareness level regarding the risk factors of breast cancer, 21% had good awareness, and 1.3% had a poor level of breast cancer risk factors.

Table 3 showed that 63.5% of students did not practice breast self-examination, while 36.5% were practiced, among them only 25.5% practicing monthly, 5.4% were regularly practicing while most of them did not practice regularly (31.1%),

Figure 2 illustrates that 56.8% of students who practice breast self-examination did it one week after the menstrual cycle, while 43.2% did not know the proper timing of performing a breast self-examination.

Figure 3 illustrates statistically significant positive correlations between the total knowledge score and the students' academic level; the higher academic level students had high total knowledge score $p=0.000$, $r = 0.209$.

Table 4 shows a non-statistically significant difference between the total student nurses' awareness level and their family history of breast cancer at p is =0.174.

Table 5 demonstrates a non-statistically significant difference in performing breast self-examination among students with positive family history and those with negative family history.

Figure 4 illustrates a statistically positive relationship between the awareness of obesity as a risk factor and the students' BMI, students with a high BMI were more aware that obesity is a risk factor for breast at $p=0.023$, $r= 0.118$.

Table (1): Frequency and percentage distribution nursing students' demographic characteristics (373).

Students' demographic characteristics	Number =373	Percent
Age		
Less than 20	132	35.4
20 – 24	226	60.6
25 – 29	13	3.5
30 and up	2	0.5
Mean ±SD	20.58±2.04	
Academic Level		
1	80	21.4
2	10	2.7
3	79	21.2
4	28	7.5
5	51	13.7
6	16	4.3
7	66	17.7
8	43	11.5
BMI		
Less than 18 (underweight)	42	11.3
18 – 24.9 (normal weight)	224	60.1
25 – 29.9over weight	81	21.7
30 and up obese	26	7
Mean ±SD	22.39±1.78	
Family History		
Yes	68	18.2
No	305	81.8

Table (2): Nursing students' mean awareness of breast cancer risk factors.

Risk Factors	Mean	SD
Male gender	3.3	1.2
Female gender	4.5	0.7
Age: 40 years and below	2.6	1.0
Age: 40 years and above	4.3	0.8
Positive family history	4.2	0.8
Early-onset of menarche	3.3	1.0
Late-onset of menopause	2.8	1.8
Having the first child after 35	3.4	1.0
Breast diseases	4.1	0.8
Dense breast tissue	3.8	0.9
Physical inactivity	3.0	1.1
Fatty food	3.5	1.0
Breastfeeding	3.3	1.4
Obesity	3.7	1.0
Smoking	3.8	1.0
Stress	3.6	1.0
Using contraceptive pill	3.6	0.9
Wearing soft bra	3.2	1.1
Total	63.9	8.4

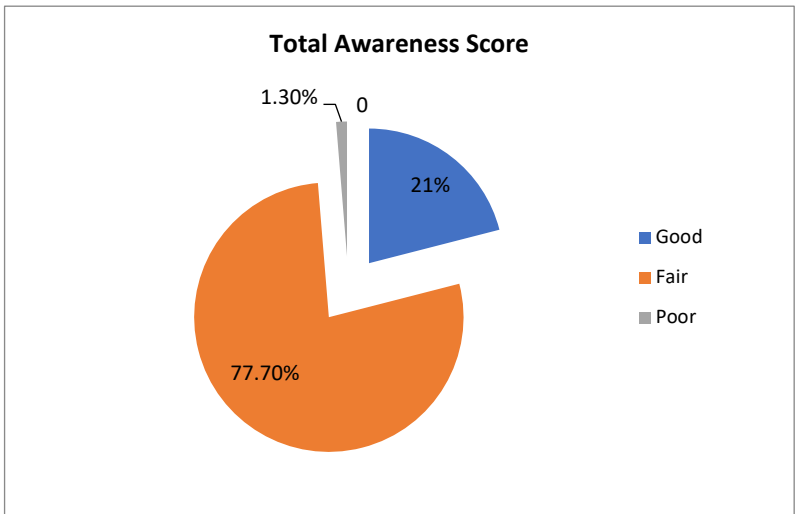

Figure (1): Student nurses' total awareness score of breast cancer risk factors.

Table (3): Frequency and percentage distribution of students' self-reported practice of breast self-examination.

Students' Practice	Number =373	Percent
Performing breast self-examination		
Yes	136	36.5
No	237	63.5
Frequency		
Weekly	5	1.3
Monthly	95	25.5
Yearly	37	9.9
Regularity		
Yes	20	5.4
No	116	31.1

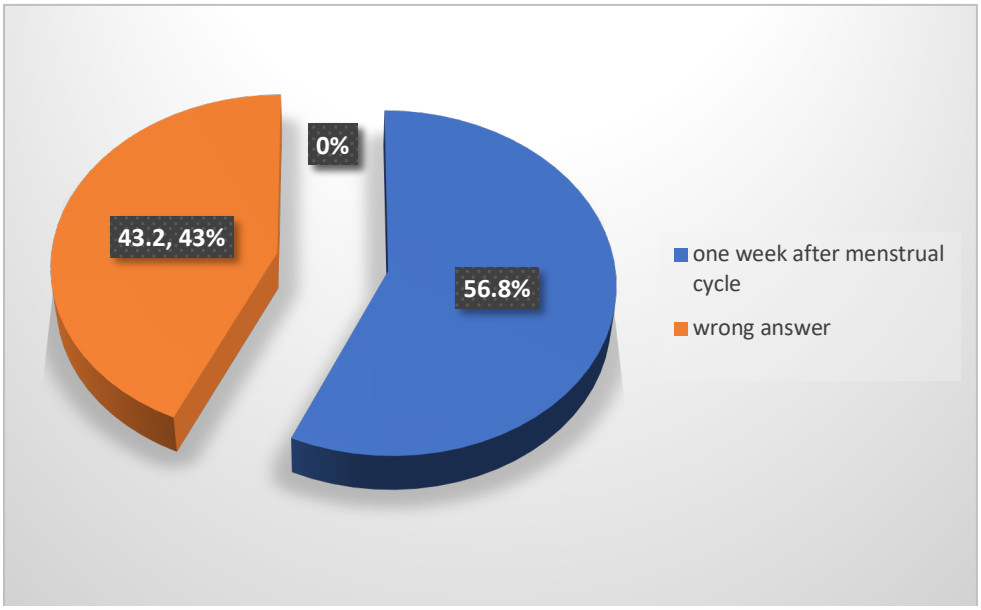

Figure (2): Percentage distribution of the timing of students' performance of breast self-examination.

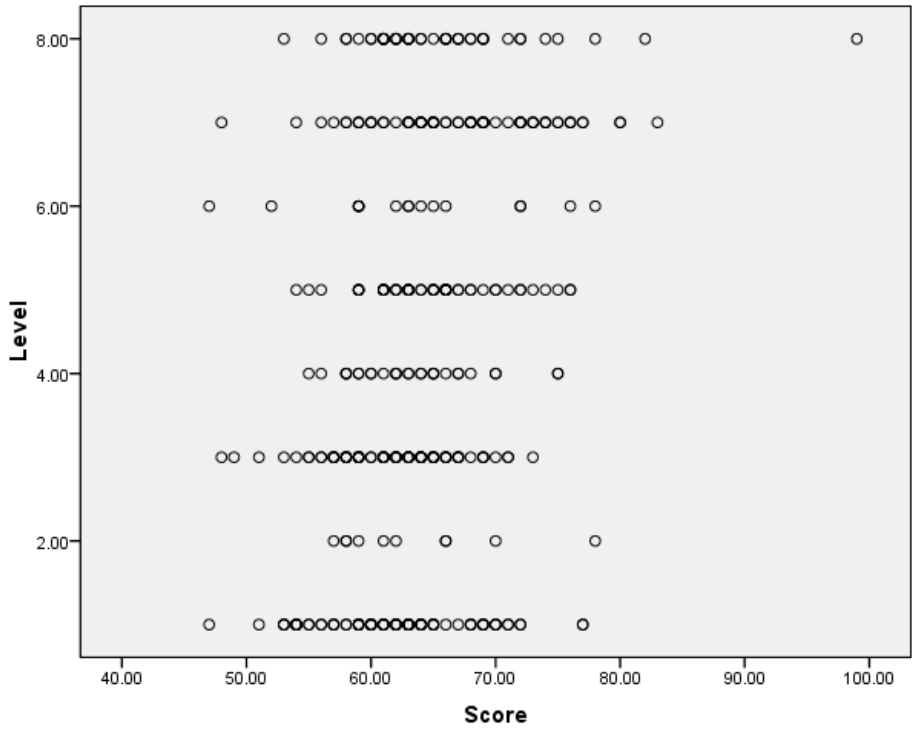

Figure (3): Relationship between the student academic level and the total awareness score.

Table (4): Relationship between the total awareness level and students' family history of breast cancer.

Total awareness level	Family History				P
	Positive		Negative		
	No.	%	No.	%	
Poor	2	2.9	3	1.0	0.170
Fair	48	70.6	243	79.7	
Good	18	26.5	59	19.3	
Total	68	100.0	305	100.0	

Table (5): The relationship between performing of breast self-examination and student nurses' family history

Performing Breast Self-Examination	Family History				P
	Positive		Negative		
	No.	%	No.	%	
Yes	25	36.8	25	36.5	0.170
No	43	63.5	43	63.5	
Total	68	100.0	68	100.0	

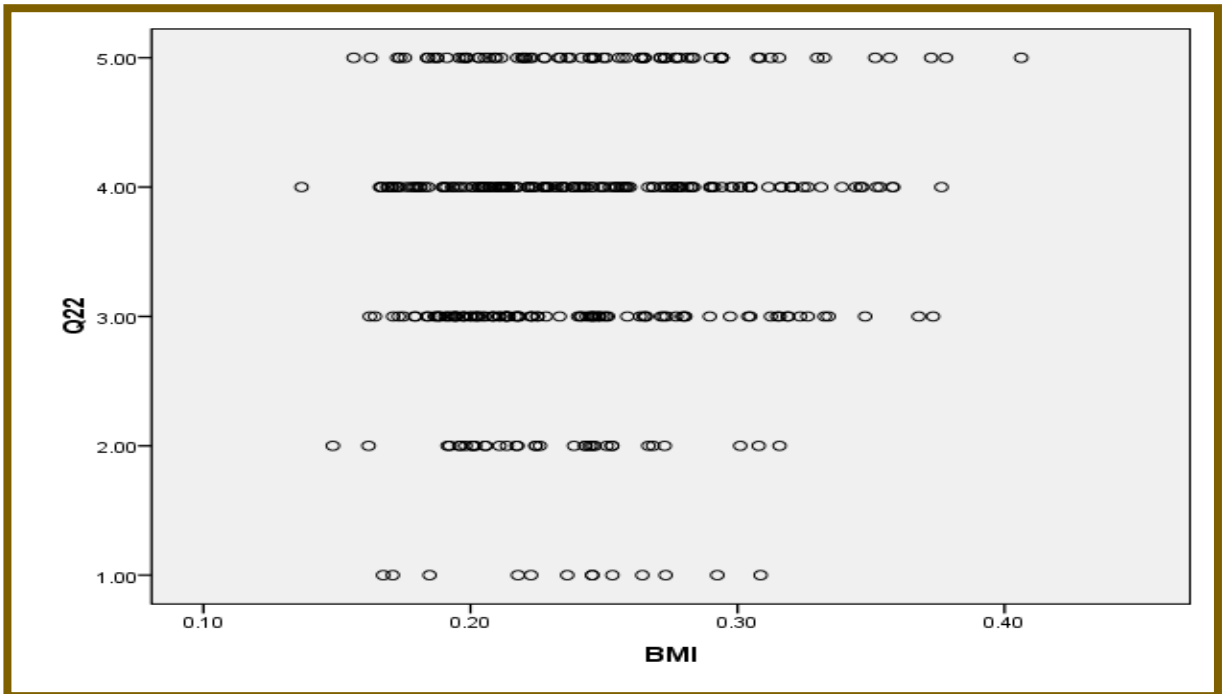

Figure (4): Correlation between the students with high BMI and awareness of obesity as a risk factor.

6. Discussion

Developing proper health habits in adolescence should lead to the maintenance of good health in adulthood. These habits can have profound, long-term ramifications on health. One of these habits is breast self-examination *(Freeman, 2000).* Few studies were conducted on the awareness of adolescents in the world, particularly in the current study setting. So, this study aimed to explore the awareness of breast cancer risk factors and the reported practice of breast self-examination among nursing students in the King Saud bin Abdulaziz University for Health Sciences-College of Nursing (CON-R).

The present study shows that about two-thirds of the studied student were in the age group between 20-24 years, and about one-third of them were less than 20 years of age with a mean age of 20.58±2.04. They have distributed on four academic grades, with only one fifth of them were in the first academic level. About two-thirds of the studied students had normal body weight while one-fifth of them were overweight, and less than a tenth were obese. About one-fifth of them had a positive family history of breast cancer.

Eldessouki and Hossien (2016) studied the awareness of breast cancer and breast self-examination among female nursing students at the faculty of nursing, Minia University. The studied students aged between 18-21 years of age, 10% of them had a positive family history of breast cancer.These findings agree with *Sama et al., (2017),* who studied the awareness of breast cancer and breast self-examination among female undergraduate students in a higher teacher training college in Cameron. Their participants were between 17 and 34years with a mean age of 22.5±3.2. Half of them were in the age group between 21-25 years. Only 5.9% had a positive family history of breast cancer.

In a study about practices of breast self-examination and associated factors among female Debre Berhan University students done by *Birhane, et al., (2017),* who found that most of the students at the age of 20-24 years of age distributed on five academic years. 96.5% had a negative family history of breast cancer. *Hamad and Khalil (2018),* studied knowledge of breast cancer risk factors and practice of breast self-examination among female students of Soran Technical Institute, half of the study participants were in the age group of 20-25, and slightly less than half were below 20 years of age. 14% of them had a positive family history of breast cancer.

Koc et al. (2018) conducted a study on female university students' knowledge and practice of breast self-examination. The study revealed that about two-thirds of the studied female students were in the age group below 20 years of age. 80.1% of them had body mass indexes between 20-24 (normal body weight), 5% were overweight, and 6% were obese. 72.7% had no family history of breast cancer. *Sujindra and Elamurugan (2015)* in a study about knowledge, attitude, and practice of breast self-examination in female nursing students reported an age range of the study group between 21-27 years with a mean age of 23± 1.56 years.

Rahman et al. (2019), in a study about awareness of breast cancer and breast self-examination among female students at the University of Sharjah. The study revealed that most of the studied students were in the age group between 18-23 (95.4%), distributed over the four academic years. A family history of breast cancer was reported by

21.6% of participants, and three participants reported a personal history of breast cancer.

These findings were contradicted with *Karayurt et al. (2008),* who study the awareness of breast cancer risk factors and practice of breast self-examination among high school students in turkey. The study reported a mean age of 16 years old and a negative family history of breast cancer for all the studied students. *Ghrayeb et al. (2018)* conducted a study regarding knowledge of breast cancer and its risk factors among Al-Quds University students in Palestine. A family history of breast cancer revealed that 65.9% of the studied students had no family history of breast cancer.

The present study showed that the student nurses had good awareness regarding such factors as female gender, age more than forty, positive family history, breast disease, early onset of menarche, breastfeeding, having a child after the age of 35, fatty foods, using contraceptive pills, stress, and obesity with a high mean score. In contrast, they have average awareness of the risk of late menopause, physical inactivity, and early onset of menarche. The current study students' nurses had a high awareness regarding the non-risk of the male gender, with an average awareness for the young age below forty (as a non-risk factor) and wearing a soft bra (as had no protective benefit against breast cancer).

These findings may be referred to as the sample of this study was student nurses who exposed to such information during their formal education. As more than four-fifths were distributed in the academic levels two and more.

Rahman et al. (2019) emphasized this explanation and stated that students from the medical campus were more knowledgeable about breast cancer risk factors compared with those from the women's and fine arts and design campuses. However, this may be attributable to the topics studied in the medical colleges. A similar explanation was reported by previous study of *Sudhanthra and Relton, (2014),* who declared that medical students' knowledge about risk factors of breast cancer was significantly better than that of non-medical students. However, the overall level of knowledge was insufficient. *Sujindra and Elamurugan (2015)* reported good knowledge among the studied student nurses.

Regarding the level of students' knowledge, the findings of the present study were similar to *Yousef (2010),* who reported a high level of nursing students' correct responses regarding breast cancer risk factors. 91% of students knew about less exercises, 82% correctly identified age and obesity among breast cancer risk factors, only 30% identified early menarche, 21% recognized late menopause, 3% fatty food consumption. Also, *Amasha, (2013),* studied breast self-examination and risk factors of breast cancer awareness among Jordanian nurses. The study revealed a high awareness level of nurses regarding the positive family history (86.6%), prolonged lactation (85.7%), aging, and family history (83.9%), high-fat diet (68.8%), decreased physical activity (67.9%), smoking (67%), long-term use of contraceptive pills (66.1%), obesity (60.7%). In contrast, they did not know about the age at first baby after thirty (35.7), and early menarche (23.2%).

Also, these results were consistent with a study done by *Abed El-Azim, (2013)*, who reported that more than two-thirds of students were agreed that the family history, increasing age, and history of the breast cancer. However, they were not sure that early menarche, obesity, and smoking are risk factors for breast cancer. The most-reported risk factors are the use of oral contraceptive pills, followed by smoking (98.6%), family history of breast cancer, and first child at a late age (98.6%, and 97.1% respectively). *Hamad and Khalil (2018)* reported high awareness of breast cancer risk factors, that early menarche (86%), late first pregnancy (72%), late menopause (62%), increasing age (52%). In contrast, breastfeeding (15%), gender (19%), positive family history (20%), lack of physical activity (24%), obesity (25%), smoking (32%), high-fat diet (33%), oral contraceptive use (40%).

Srivastava et al. (2016) reported an average awareness when studied the awareness of breast cancer risk factors and practice of breast self-examination among nurses of tertiary care hospitals. The result showed an average awareness of the studied staff nurses regarding the risk factors of increasing age (61.5%), oral contraceptive and hormone replacement therapy (59%), while only 39.5% were aware of obesity, 36% early menarches, 32% early menopause. Also, *Sama, (2017),* stated similar level regarding the risk factors of smoking, and hormone replacement therapy among 58.2% of the studied students, high-fat diet (45.5%), inactivity and sedentary lifestyle (40.1%), obesity (35.5%), positive family history (33.9%). Only 21.7% of students had awareness with the risk factors of first child at a late age, 17.8% wearing tight brassier, 16.8% increasing age, 10.9% gender, 9.2% late menopause, and 8.2 early age at first menstruation.

Knowledge gaps in risk factors have also been reported elsewhere among nurses in Pakistan *(Ahemd et al., 2006)*, female teachers in Malaysia *(Parsa et al., 2008),* most of the students in Turkey (*Karayurt et al., 2008).* The most widely known risk factors by the students were personal history of breast cancer (68.7%) and family history of breast cancer (67.0%) among the general population *(Amin et al., 2009; Al-Dubai et al., 2011),* University students in Angola *(Sambanje&Mafuvadze, 2012),* female teachers in Kuwait *(Alharbi et al., 2012),* and female medical students in Saudi Arabia *(Nemenqani et al., 2014).*

In contrast, many studies revealed a low awareness level. *McTiernan (2003)* reported that the students turned out to know little about lifestyle changes to correct breast cancer risk factors such as obesity, high fat diet, smoking, and alcohol use. Studies were done by *Seth et al. (2005); Kumar et al. (2011)* and have shown low awareness levels of risk factors. The findings also showed that very few students had some knowledge about other risk factors as (obesity, early menarche, breastfeeding for at least 18 months *(Iheanacho et al., 2013).* Also, *Eldessouki and Hossien (2016)* reported that studied nursing students had inadequate knowledge of breast cancer risk factors before education. They showed high awareness with the risk factor of breastfeeding (73.75), less exercise (70%), oral contraceptive use (60%), while less than fifty percent of

nursing students were aware of genetic factors (46.25%), first child at a late age (41.25%), and about one third were aware of aging (33.75%), obesity (32.5%), early onset of menarche (27.5%), late menopause, and smoking (22.5%).

Madhukumar, et al., (2017), in a study about awareness about breast cancer and practice of breast self-examination among basic science college students. The study revealed that 60% of the studied students were aware with the risk factors of age, smoking 59%, while age at parity 17%, exercise 15%, age at menopause, and oral contraceptive pill consumption 19%, diet 24%, family history and breastfeeding 28%. *Ghrayeb et al. (2018)* reported a low level of knowledge regarding breast cancer risk factors. The most widely known risk factors by the students were old age 62.7%, obesity 44.0%, and never being pregnant 30.7%. A high level of estrogen was not known as risk factors for breast cancer by the vast majority of the students. *Rahman et al. (2019)* reported the female students' awareness of breast cancer risk factors. The study reported that 84.2% had correct knowledge regarding the family history, 59.3 regarding smoking, hormone therapy 45.2%, age 43.6%, late menopause 40.2, high fat diet 36.1%, lack of physical activity 34.9%, breastfeeding 28.6%, contraceptive pills 28.2%, late age at full-term pregnancy and obesity 25.7%.

The present study demonstrates that total awareness of student nurses was one-fifth of the student nurses had good awareness; more than three-fourths had fair awareness level regarding the risk factors of breast cancer. *Hamad and Khalil (2018)* reported a similar finding that about half of their studied female students had average knowledge, and more than one third had good knowledge about breast cancer.

Despite the good knowledge of the student nurses, the current study shows that about two-thirds of students did not practice breast self-examination, with only one-third of them practiced breast self-examination, among them only one fourth practicing monthly, only five percent was regularly practicing. In contrast, the highest percentage of them did not practice regularly (about one third). Also, less than half of them did not know the proper timing of performing a breast self-examination. This finding might be referred to as their young age, minimum clinical experience, most of them had a negative family history, which makes them not very concerned to protect themselves by BSE. It might be an inquiry for future research to investigate this phenomenon.

This finding is almost similar to the results of a study conducted in Nigeria *(Gwarzo et al., 2009).* Also, *Yousef (2010)* conducted a study on the nursing students at the faculty of nursing at king Abdulaziz university on a sample of 33 student nurses, 33% of the participants performed BSE regularly every month, while 21% had never performed BSE. However, the study among female university students in Egypt reported that only 8.8% of students knew the appropriate time to perform BSE *(Boulos & Ghali, 2014).*

Similar findings reported by*Al-Sharbatti, et al., (2013),* in Ajman, United Arab Emirate (UAE), *Akhtari et al., (2015)* in Malysia, University of Buea Cameroon *(Nde, et al. 2015),* and *Sjindra and Elamurugan, (2015),* who reported the level of practice of BSE among the study population. It was only 33.3% who performed BSE regularly in a year (12 times/year), (63.3%) were doing it on any day of the month. *Birhane, et al., (2017)* reported the practice of BSE among students from health science collages, only 22.5% performed BSE, 66.4 of the students were correctly known the proper timing of performing BSE.

Koc, et al., (2018) reported that about two-thirds of the university studied female students had correct knowledge of how often the BSE performed (monthly), while 60% did not know the proper time of performing BSE. 50.8% of the female students did not practice the BSE, 66.7% of the remaining students did not practice it regularly, not practicing in the proper time (55%). *Rahman et al., (2019)* reported that 72.3% of the studied students did not perform BSE, among the 27.7% who perform BSE, 41.3% did it rarely, 26.1% did it at least every 6 months, only 58.4% answered correctly on the proper time and frequency of performing.

These findings are contradicted with a study conducted in Turkey by *Beydag and Karaoglan (2007)* found that 50% of female university students did not know how to perform BSE. *Karayurt et al. (2008),* reported that 6.7% of students were performing BSE monthly and 20.3% of the students were performing BSE irregularly. Also, a small percentage of the students had correct knowledge about appropriate time for BSE (13.2%), frequency of BSE (21.8%), and BSE procedure (26.6%). These findings are matched with *Alkhasawneh et al., (2009),* on Jordanian nurses and revealed that less than fifth of them practice BSE on regular basis as recommended. Also, 29% in Senegal *(Gueye et al., 2009).* Similarly, close to three-quarters of female undergraduate students in the Ahmadu Bello University, Zaria, Nigeria had heard about BSE, only about one in five had ever practiced it *(Gwarzo et al., 2009).*

Comparable findings were reported by *Alwan et al., (2012),* 42.6% of female undergraduate students in Kirkuk University, Iraq practice BSE, and the 37.3% of health extension workers in Ethiopia *(Azage, et al., 2013).* Also, *Amasha, (2013)* reported that 44.6% of the studied nurses did not perform BSE ever, in contrast 75.8 knew the proper time for performing BSE, and among those who perform BSE, 80.6% did not perform regularly. This finding was consistent with that of a study among female university students in Jordan that reported 11% of participants performed BSE *(Suleiman, 2014).* It is comparable to 41% reported by *Nde etal (2015)* among female undergraduate students in the university of Buea, Cameron. *Eldessouki and Hossien (2016)* reported that 66.25% of the studied nursing students did not perform BSE before.

Sama (2017) reported an infrequent practice of breast self-examination, only 38.5% of the participants had ever performed a BSE. *Ghrayeb, et al., (2018)* reported only 188 (56.6%) participants correctly identified that BSE should be performed monthly on a regular basis, though only 161

(48.5%) respondents knew the correct timing for performing BSE. *Hamad and Khalil, (2018)* reported a similar finding of 68% of the studied female students did not perform before the BSE, 62% of them did not know how to perform it, among those who perform BSE 62% did not know the frequency of BSE and only one quarter mentioned that it should be done monthly. Also, 60% of them did not know the appropriate time of doing BSE

The study demonstrates a statistically significant positive correlations between the total awareness score and the students' academic level; the higher academic level students had high total knowledge score. This is referred to the knowledge load of student nurses as they progress though their courses, they obtain more knowledge. The current study also shows a non-statistically significant difference between the total student nurses' awareness level and their family history of breast cancer, and a non-statistically significant difference between performing breast self-examination and students' family history.

This finding is consistent with *Jarvandi et al., (2002),* who reported no relation between family history of breast cancer and BSE performance. This goes with *Karayurt, et al., (2008),* who reported that there was no significant relation between BSE practice and family history of breast cancer. *Amasha, (2013)* reported a non-statistically significant difference between practicing BSE and family history. Also, *Hamad and Khalil, (2018),* reported a non-significant relationship between student' knowledge and their family history of breast cancer, also a non-statistically significant difference between BSE knowledge and family history. In contrast to these findings, *Maxwell et al., (2000); Maxwell (2001)* reported a relation between family history of breast cancer and regular BSE performance.

The present study illustrates a statistically positive relationships between the awareness of the obesity as a risk factor and the students BMI, students with a high BMI were more aware that obesity is a risk factor for breast. This finding is contradicting the results of *Alasmari, et al., (2017),* who found a non-significant difference between awareness of obesity and BMI. Also, *Hooper et al., (2018)* reported a non-statistically significant relationship between the awareness of cancer and BMI among health care professionals.

7. Conclusion

The findings of this study concluded that the nursing students reveals a good awareness of most of the breast cancer risk factors, as female gender, age more than forty, positive family history, breast disease, early onset of menarche, breast feeding, having child after age of 35, fatty foods, using contraceptive pills, stress, and obesity with a high mean score. In contrast they have average awareness of the risk of late menopause, physical inactivity, and early onset of menarche. Despite a good awareness level, the study demonstrated that about two-thirds of students did not practice breast self-examination, among the remaining only one fourth practicing monthly, only five percent was practicing regularly while the highest percentage of them didn't practice regularly. Also, less than half of them did not know the proper timing of performing breast self-examination.

The study demonstrates a statistically significant positive correlations between the total knowledge score and the students' academic level. A non-statistically significant difference between the total student nurses' awareness level and their family history of breast cancer, and a non-statistically significant difference between performing breast self-examination and students' family history. The present study illustrates a statistically positive relationships between the awareness of the obesity as a risk factor and the students BMI.

8. Recommendations

- Conduction of awareness campaigns in all university campus who encompassing female students to enhance their awareness of breast cancer risk factors and promote their practice of breast self-examination.
- Replicate the study on a large probability sample of Saudi female targeting various socioeconomic, age group and educational background.
- Further study to investigate the relationships between the breast cancer risk factors and the sociodemographic characteristics of the female university students.
- Developing of educational programs that are accessible to a large number of female university students using the information technology and disseminated it through the mass media.

9. References

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