

## KNOWLEDGE AND PRACTICE OF BREAST SELF-EXAMINATION AMONG FEMALE MEDICAL STUDENTS IN CLINICAL AND PRE-CLINICAL STAGES AT AL-KINDY COLLEGE OF MEDICINE/ BAGHDAD UNIVERSITY

معرفة وممارسة الفحص الذاتي للثدي عند طالبات المراحل السريرية وقبل السريرية  
في كلية طب الكندي بجامعة بغداد

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### ملخص البحث

**هدف البحث:** يعتبر الفحص الذاتي المنتظم للثدي من أفضل وسائل ملاحظة التغيرات الطارئة في الثدي، حيث يمكن أن تكون هذه التغيرات عن المظهر الطبيعي للثدي علامة من علامات وجود آفة في الثدي. يمكن أن يساعد التعليم المناسب في تحسين الوعي وممارسة الفحص الذاتي للثدي. تهدف هذه الدراسة إلى تحديد تأثير التعليم على الوعي والمعرفة وممارسة الفحص الذاتي للثدي بين طالبات الطب.

**طرق البحث:** تم إجراء دراسة مقطعية شملت طالبات الملتحقات بكلية الكندي للطب في الفترة من 1 تشرين الثاني 2018 وحتى 30 أيار 2019. شملت الدراسة طالبات كلية الطب من السنة الأولى إلى السنة السادسة. تم اختيار 50 طالبة من كل فصل بشكل عشوائي، وتم تحليل البيانات التي تم جمعها بناءً على نموذج الاستبيان، وإحصائياً بواسطة برامج SPSS و Chi-square.

**النتائج:** بلغ عدد طالبات الطب المشاركات في هذه الدراسة 300 طالبة، أي 50 طالبة من كل فصل. تراوحت أعمارهن بين 18 و 24 سنة. بلغت نسبة المشاركات اللواتي لديهن قصة عائلية إيجابية لسرطان الثدي 17.7%. كان الوعي بالفحص الذاتي للثدي كطريقة للكشف عن سرطان الثدي إيجابياً في 87.3% من طالبات الطب. كان المصدر الأكثر شيوعاً للمعلومات حول الفحص الذاتي للثدي هو المحاضرات والندوات وورش العمل (بنسبة 46.7%). بينما لوحظ أن 36.7% فقط من طالبات الطب يقمن بالفحص الذاتي للثدي.

**الاستنتاجات:** أظهرت طالبات الطب معرفة جيدة للغاية بالفحص الذاتي للثدي، ولكن مع تطبيق سيء لهذه الممارسة.

### ABSTRACT

**Objective:** Regular breast self-examination is the best way to notice breast changes. Alterations from the normal appearance could be a sign of breast disease. Proper education can help to improve awareness and practice of breast self-examination. The aim of this study was to evaluate the effect of education on the knowledge and practice of breast self-examination among female medical students.

**Methods:** This is a cross-sectional study, conducted

in Al-Kindy College of Medicine at the period from 1 November 2018 to 30 May 2019. Fifty female students were chosen from each class randomly and were grouped in to pre-clinical group (classes 1, 2, and 3), and clinical group (classes 4, 5, and 6). The data, gathered based on questionnaire form, were analyzed statistically by SPSS version 17 software applications, chi-square test was used to determine p-value.

**Results:** A total number of 300 medical students included in this study. Age range from 18 to 24 years (mean age 20.5 years). Participants students with a

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positive family history of breast cancer were 53 students (17.7%). Awareness of breast self-examination as a screening method for breast cancer was positive in 262 students (87.3%). The main source of breast self-examination information was lectures, seminars and workshops in 140 students (46.7%). Students in the clinical group had more knowledge about the monthly frequency of practicing breast self-examination 116 students (77.33%) than the pre-clinical group 85 students (56.65%). Moreover, students in the clinical group were practicing breast self-examination more than students in the pre-clinical group, 77 students (51.33%) and 33 students (22%), respectively.

**Conclusions:** Female medical students at the clinical stage showed a good knowledge and fair practicing of breast self-examination as compared to female medical students at pre-clinical stage.

## INTRODUCTION

Breast cancer in women is a major health burden. It's one of the non-communicable diseases, and is the most common cancer in women worldwide, not to overcome the fact that it affects both sexes in high- and low-income countries.<sup>1,3</sup> It accounts for over one million of the estimated 10 million neoplasms in its maximum in the USA and South America.<sup>4</sup> While in other studies the rates of incidence range from 19.3 per 100,000 women in Eastern Africa to 89.9 per 100,000 women in Western Europe,<sup>7</sup> incidence is increasing in the developing world due to increase life expectancy, increase urbanization and adoption of western lifestyles.<sup>6</sup>

Overall; the average incidence for this disease in developed countries is usually more than 80 per 100,000 while it is less than 40 per 100,000 in the developing world. Although breast cancer is thought to be a disease of the developed world, almost 58% of deaths occur in less developed countries.<sup>2</sup>

In Iran, breast cancer constitutes 25% of all cancer among Iranian women. In Pakistan it's (34.6%), in Saudi Arabia breast cancer is the most frequent cancer of women (23%) of all cancer.<sup>4</sup>

Within the Eastern Mediterranean Region (EMR),

cancer is the fourth-ranked cause of death, after cardiovascular diseases, infectious diseases, and injuries. The International Agency for Research on Cancer (IARC) estimated that 292,677 cases of cancer were newly diagnosed among the female population in EMR during 2012. The five most commonly recorded cancers in women were those of the breast, colorectal, cervix, ovary, and non-Hodgkin lymphoma. Overall; 99,000 cases were registered as breast cancer in that region.<sup>8</sup> It has been predicted that the largest increase in cancer incidence within the next 15 years worldwide is likely to be in the Eastern Mediterranean Region (EMR).<sup>9</sup>

In Iraq, according to a registered data for breast cancer cases were collected from the Iraqi Cancer Registry/ Ministry of Health, the significance of incidence rate trends during 2000-2009 was tested. Age-standardized rates (ASR) and age-specific rates per 100,000 populations were calculated. A total of 23,792 incident breast cancer cases were registered among females aged above 15 years, represented 33.8% of all cancers in females registered during 2000-2009. The median age at diagnosis was 49 and the mean age was 52 years. The incidence rate of all female breast cancer in Iraq (all ages) increased from 26.6 per 100,000 in 2000 to 31.5 per 100,000 in 2009. The incidence in age groups (40-49), (50-59) and (more than 70) increased in earlier years, and has recently (2005-2009) become stable.<sup>10</sup> Another study in 2012 showed that breast cancer ranks the first among the commonest malignancies among all the population, and accounts for approximately one-third of the registered female cancers according to the latest Iraqi Cancer Registry,<sup>9</sup> measuring 34.4% of the registered female cancers with an incidence rate approximating 23/100,000 female population, accounting for about 19% of all newly diagnosed cancers.<sup>9,11</sup>

There is a large variation in breast cancer survival rates around the world, 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.<sup>12</sup> 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,<sup>6</sup> this lightens the fact that gaps about the relative importance of breast cancer in the community emphasized the necessity for practical policy decisions to elevate the level of awareness among women.<sup>11</sup> It has been estimated that by the year 2020, approximately 70% of new cancer cases will occur among individuals in developing countries and population groups that have previously enjoyed low incidence, with a substantial fraction likely to be breast malignancies.<sup>3</sup>

Methods of prevention: Early detection and diagnosis can greatly increase chances for successful treatment, and thus increasing awareness of the possible warning signs of the disease among the general public is a necessity. The three screening methods are recommended for breast cancer include breast self-examination (BSE), clinical breast examination (CBE) and mammography.<sup>13</sup>

CBE and mammography require hospital visit, specialized equipment and expertise, whereas BSE is an inexpensive tool that can be carried out by women themselves.<sup>14</sup> BSE was first tested among the members of the Martha Organization in Finland in 1970s, and in 1992, a women's organization launched ProMama, an organization that promotes BSE training.<sup>15</sup>

BSE benefits women in two ways: women become familiar with both the appearance and the feel of their breast and detect any changes in their breasts as early as possible. There is evidence that women who correctly practice BSE monthly are more likely to detect a lump in the early stage of its development, and early diagnosis has been reported to influence early treatment, to yield a better survival rate.<sup>16</sup> In the literature, it is stated that 90% of the times breast cancer is first noticed by the person herself.<sup>17</sup>

In a study of the relation between BSE and survival of breast cancer patients, 1004 patient diagnosed with invasive breast cancer followed for 92 months, showed that 14% of the breast self-examination performers had died of breast cancer versus 26% of the non-performers, with survival at 5 years was 75% for BSE performers versus 57% for the nonperformers.<sup>18</sup> Another study of the effects of BSE and breast examination by physicians on the stage of breast cancer at diagnosis.

A of data 293 women with breast cancer showed that tumors were detected in clinical stage I about 53.8% when the detection method was routine physician examination, 37.7% when it was self-examination and only 27.0% when detection was accidental.

Differences were less apparent when pathological stage was considered. Tumors found during routine examination of the breast averaged 6.1 mm smaller in diameter than those discovered accidentally. We estimate that breast-cancer mortality might be reduced by 18.8-24.4% through self-examination or routine physician examination.<sup>19</sup>

Even though BSE is a simple, quick, and cost-free procedure, the practice of BSE is low and varies in different countries. Several reasons like lack of time, lack of self confidence in their ability to perform the technique correctly, and fear of possible discovery of a lump have been cited as reasons for not practicing BSE.<sup>2</sup>

In our socioeconomic setup the only feasible solution to promote early detection of breast cancer is to create 'breast cancer awareness' among females' population.<sup>4</sup>

Breast Self-Examination (BSE) is a technique in which a woman examines her own breasts by seeing and feeling with fingers to detect breast lump. The purpose of breast self-examination is to increase familiarity with breast, to detect presence of lump in the breast at an early stage and to look for any abnormal changes in the breast. Self-examination of the breast each month between the 7th and 10th day of the menstrual cycle is the simplest yet extremely important way to detect breast cancer at the early stage of growth. The BSE technique involves palpation of the breasts for lump with the tips of the fingers, rather than the flat of the hand. The woman would be in the erect position, either sitting or standing and while lying down. It has been observed that women can detect 95% of breast cancers and 65% of early minimal breast cancers through BSE.<sup>20</sup>

The women should follow these steps when she examines her breasts:

Step 1: Stands in front of mirror and checks her

breasts for the changes including change in breast size or shape, thickening in the skin of the breast or under area, swelling, redness or darkening of the breast, dimpling or puckering of the breast skin, itchy scaly sole or rash on the nipple, pulling in the nipple or another part of the breast, pain in one part of the breast.

Step 2: Raises the hands and looks under her breasts for same changes, also feels for lump or hardness in these areas.

Step 3: Check the nipples for any discharge or fluid secretion, the discharge may be (watery, milky, yellowish, or even associated with blood).

Step 4: Lying down on a firm surface on her back, and using slow circular motions feels her breasts for any kind of lump, and following a pattern to cover the whole breast beginning from the nipple moving in larger and larger circles until reaching the outer edge of the breast, then she must check the inner part of the hear armpit as well.

Step 5: Stand up and repeat the same circular motions from step 4 while standing.<sup>21</sup>

Health behaviors such as BSE can help empower women to take some control and responsibility over their health promotion. Although the value of BSE is controversial, American Cancer Society recommends as an option breast awareness and BSE for early detection of breast cancer. The rationale behind extending BSE practice as a screening test is the fact that breast cancer is frequently detected by women themselves without any other symptoms.<sup>22</sup>

**Literature review:** There are many studies in Iraq concerning BSE knowledge and practice among female medical students, females of medical fields and samples of educated females.

In a study done by Alwan AS et al, published in 2015 concluded that women in Iraq often rely on their primary health care providers to obtain adequate guidance on health promotion and screening. The findings reveal insufficient conformity in the attitudes towards the practice of breast cancer management among the general paramedical providers despite their acceptable level of awareness.<sup>11</sup>

In another study among sample of women in Shatra/Dhi-Qar/Iraq, the participants have a good idea about the significance of BSE, about 79% of all women had heard of the importance of BSE for BC screening, know the warning signs, and 53% of them know how to do it, but only small number 49 (24%) actually practice BSE.<sup>23</sup>

Another study in Baghdad among Al-Mansur Institute of Medical Technology students provided by Shatha AMA in 2012 found that females referred to the institute had very little practices about (BSE), and identified the negative influence of low knowledge on the practices of BSE.<sup>4</sup> A study provided by Hussein MM et al among female students in Erbil, the study found that most of the contributors 103 (88%) were in a poor performing level, 7 (6%) were in satisfactory, and 7 (6%) were in a good level of practicing BSE, as a conclusion. The midwife and nursing students knowledge regarding breast self-examination is poor, as well as the practice.<sup>24</sup>

According to a study by Al-Azmya SF et al published in 2013, women who lack confidence in their ability to perform BSE correctly or who have not been instructed on how to do BSE appeared to perform BSE less frequently and to have less competence in performing the technique. Therefore, training social workers, school teachers and others who are regarded as trusted agents of the community could be beneficial for BSE practice, PHC professionals could play an important role in conveying correct information regarding BSE.<sup>16</sup>

Finally a study by Samira ME in 2014 among females in Basra city, concluded that teaching BSE and issues about breast cancer as early as possible will go a long way to encourage positive behavior towards BSE, create a 'breast-awareness' consciousness and can lead to seeking regular professional breast examination/screenings later in life.<sup>25</sup> The aim of this study was to evaluate the effect of education on the knowledge and practice of breast self-examination among female medical students.

## METHODS

This is a cross-sectional study with a setting in Al-Kindy College of Medicine in the period from the

1st of November 2018 to 30th of May 2019. The study involved the medical female students from 1st class to 6th class. Fifty female students were chosen from each class randomly by a convenient random sampling collection type, and were grouped in to pre-clinical group (classes 1, 2, and 3) and clinical group (classes 4, 5, and 6). Each student was asked according to a questionnaire form by direct interview about the details of knowledge and the practice of breast self-examination (BSE), Figure 1. We compared the data from both groups in order to find the effect of education on knowledge and practice of breast self-examination.

**Statistical analysis:** Collected results were assessed statistically using SPSS version 17 and we used the Chi-square test to measure the p-value, p-value <0.05 was considered significant.

**Ethical consideration:** The research proposal of the

study was approved by the scientifically ethical Comity in Al-Kindy College of medicine. The students were ensured about the confidentiality of collected information, and that the data will be used for research purposes only.

## RESULTS

A total number of 300 medical students included in this study, 50 students from each class. Age range of the study participants were from 18 to 24 years, mean 20.5 years. Fifty three students (17.7%) had a positive family history of breast cancer. Awareness of breast self-examination as a screening method for breast cancer was positive in 262 students (87.3%), Table 1.

The most commonly reported source of breast self-examination information was lectures, seminars and workshops 140 students (46.7%), followed by social media 78 students (26%) and TV/radio 45 students (15%), Figure 2.

### Questionnaire form:

1. Age:
2. Educational level:
3. Family history of breast cancer
4. Participants awareness about breast diseases particularly breast carcinoma?
5. BSE knowledge:
6. Resources they learnt it from?
7. The age and time at which BSE must be performed?
8. Do you believe in its efficacy?
9. Participants practicing BSE or not.?
10. The reasons behind not doing:
11. Proper steps for BSE:
  - a. Standing position in front of a mirror with both hand beside the body inspect the followings: Abnormal swelling, color changes, tethered skin, Peau d'orange, nipple retraction, nipple deviation, nipple discharge, axillary mass, ulcer, sinus, color changes.
  - b. Put and press both hands over the iliac crest, bends forward and notice any change in breast size, shape and the level of the nipples.
  - c. Put both hands above the head and depress the shoulders and notice any change in breast size, shape.
  - d. Palpate with the tip of 3 fingers the 4 quadrants of the breast, the nipple for any tenderness, masses.
  - e. Palpate the axilla for any tenderness, masses.
  - f. Squeeze the areola and watch for any abnormal nipple discharge.
  - g. In supine position, put pillow below the shoulder and repeat the steps d, e and f for each side.

Figure 1. Questionnaire form.

| Variables  |            | No. | %    |
|--|------------|-----|------|
| Age (years)  | 20 or more | 202 | 67.3 |
|  | 18-19      | 98  | 32.7 |
| Family history of breast cancer                          | Positive   | 53  | 17.7 |
|  | Negative   | 247 | 82.3 |
| Awareness of BSE as a screening method for breast cancer | Yes        | 262 | 87.3 |
|  | No         | 38  | 12.7 |

Table 1. Demographic data of the participant students.

| Groups       | Appropriate time of BSE   |                           |              | Total | p-value |
|--------------|---------------------------|---------------------------|--------------|-------|---------|
|              | 5 days after menstruation | Regular day of each month | I don't know |       |         |
| Pre-clinical | 67 (44.67%)               | 19 (12.66%)               | 64 (42.67%)  | 150   | 0.195   |
| Clinical     | 77 (51.33%)               | 24 (16%)                  | 49 (32.67%)  | 150   |         |
| Total        | 144                       | 43                        | 113          | 300   |         |

Table 3. Knowledge about the appropriate time of BSE.

One hundred and sixteen students, in the clinical group, were aware that BSE should be performed monthly as compared to 85 students in the pre-clinical group (p-value 0.001), Table 2.

Regarding the knowledge about the appropriate time of BSE, 67 students (44.67%) in the pre-clinical group were aware that BSE should be done at 5 days after menstruation as compared to 77 students (51.33%) in the clinical group. No statistical differences were detected (p-value 0.195), Table 3.

Only 110 students (36.67%) were practicing BSE, majority were in the clinical group, 77 students (51.33%), Table 4.

Majority of participants (140 students, 63.3%), refuse to answer the question of how to practice BSE, and from those who answered this question, only 67 students (22.3%) did practice BSE properly and completely, Figure 3.

## DISCUSSION

It was stated by Lierman et al in 1994 that education

| Groups       | Frequency of BSE |              |             | Total | p-value |
|--------------|------------------|--------------|-------------|-------|---------|
|              | Weekly           | Monthly      | Yearly      |       |         |
| Pre-clinical | 3 (0.02%)        | 85 (56.65%)  | 62 (41.33%) | 150   | 0.001   |
| Clinical     | 3 (0.02%)        | 116 (77.33%) | 31 (20.65%) | 150   |         |
| Total        | 6                | 201          | 93          | 300   |         |

Table 2. Knowledge about the frequency BSE.

and peer support are important to ensure women regularly apply BSE every month.<sup>26</sup> Our results are in accordance to this fact, based on our comparison between preclinical's and clinical's knowledge, practice of BSE and how education had a major role in dispersing the results.

Regarding socio-demographic characteristics aspect of the of participants, their age ranged from 18 to 24 years with mean age of 20.5 years, and most of them were single which was not surprising among students in the years of medical college.

Our study showed that family history of breast cancer among all participants was reported 17.7% which is higher score compared to another studies, one conducted in Basra city done by Samira ME in 2014 among female nursing students making 8.1% of all participants,<sup>25</sup> another is Ethiopian study done by Mesfin T et al in 2016 among Female Health Science Students 5.2%,<sup>5</sup> and a study in Saudi Arabia by Safiya KI et al in 2017 at Qassim University result was 11%.<sup>15</sup>

We predicted that the overall level of awareness

| Groups       | Practice of BSE |              | Total | p-value |
|--------------|-----------------|--------------|-------|---------|
|              | Yes             | No           |       |         |
| Pre-clinical | 33 (22%)        | 117 (78%)    | 150   | 0.000   |
| Clinical     | 77 (51.33%)     | 73 (48.67%)  | 150   |         |
| Total        | 110 (36.67%)    | 190 (63.33%) | 300   |         |

Table 4. Practice of BSE.

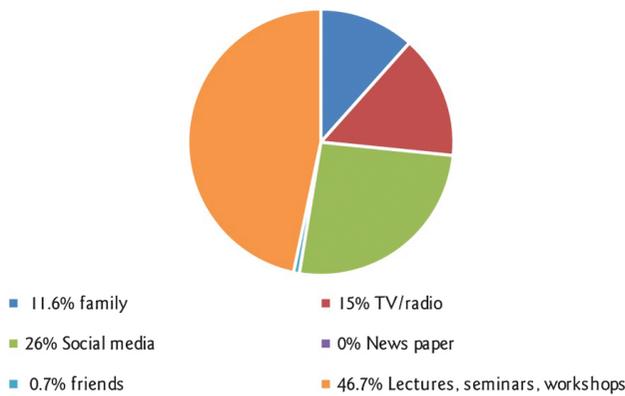


Figure 2. Source of knowledge about BSE.

about BSE among all the participants (both clinical and preclinical groups) was 87.3%, compared to studies among female students in Saudi Arabia by Elsadig YM et al in 2016 where awareness was 79.3%.<sup>6</sup> In Jordan a study by Amal KS in 2014 the awareness was 51.8%,<sup>27</sup> also in Cameroon by Fon Peter N et al in 2015, the awareness was 62.6%,<sup>28</sup> but was lower compared to a study in Nigeria by Olugbemi OM et al in 2015 awareness was 91.3%.<sup>29</sup>

Regarding participants knowledge of BSE; the majority of medical students in this study had their first information from lectures, seminars and workshops 46.7%, this emphasize the truth about how proper education can positively influence good level of knowledge, and maybe leads to proper level of practicing BSE, this percentage is slightly higher than the results of a study in Taif-Saudi Arabia 42.2%, also among female medical students done by Dalal MN et al in 2014.<sup>30</sup>

Social media came second as a main source of knowledge about BSE 26%, followed by TV/Radio with 15% and family 11.6%. Other sources of information in our study were friends 0.7% and lastly newspapers 0%. Other studies around the world like in Erbil city among female students of technical medical institute done by Hussein MM, et al in 2017 found that major sources of knowledge were TV and social media 35.9%, and least source was family 5.1%.<sup>24</sup> The results in Erbil city are slightly corresponding to a study in Kampala Uganda among female university students done by Katende G, et al in 2016 where results are 56.9% for social media and 12.3% for family.<sup>32</sup> While a study in

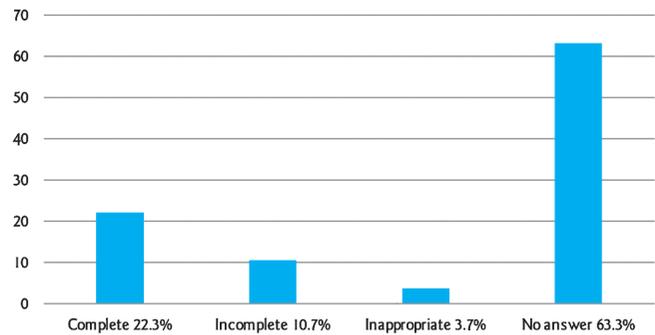


Figure 3. The purpose practice of BSE.

Nigeria in 2015 done by Olugbemi OM, et al among female undergraduates concluded that major sources of knowledge were health workers 28.1% and TV/radio 22%, followed by books 18.2% and internet 15.7%, and least sources were friends 10.2% and family 5.8%.<sup>29</sup>

In this study, 116 students (77.33%) in the clinical group versus 85 students (56.65%) in the preclinical group knew that the BSE should be performed monthly, this statistical significant finding ( $p\text{-value} > 0.001$ ) showed the effect of education, through lectures, seminars and tutorials, on the improved knowledge of BSE in medical students. Regarding the appropriate time at which BSE must be performed, the findings in our study showed that 67 students (44.67%) in the preclinical group and 77 students (51.33%) in the clinical group were aware that the BSE should be performed 5 days after menstruation, while (37.66%) of the respondents in both groups didn't know when to be performed. These findings are comparable to the results of Ibnawadh SK, et al in Qassim University-Saudi Arabia in 2017 which showed that less than half of the medical students (42.6%) knew about the proper time of BSE.<sup>15</sup>

The data in our study suggest that only 110 students (36.67%) were practicing BSE. Majority were in the clinical group, 77 students (51.33%), this finding is similar to a study done by Mohamed EY, et al in 2016 in Saudi Arabia that showed only (28.9%) perform the BSE.<sup>6</sup> Our results revealed that (63.33%) of respondents never performed BSE, this is comparable to the results conducted at Saudi Arabia done by Nemenqani DM, et

al in 2014 which showed that 39% of respondents never practice BSE.<sup>30</sup> This is also consistent to another study at Kirkuk done by Alwan NS, et al in 2012, where 42.6% of females have heard about BSE but have never practiced the technique, the causes behind this finding include either the lack of confidence in their own examination (27%), fear from detecting a lump in the breast (25%), or that they had not been instructed to perform BSE (20%).<sup>31</sup> In the present study, the majority of participants (140 students, 63.3%) refuse to answer the question of how to practice BSE, and from those who answered this question, only (22.3%) of students followed the correct steps in practicing BSE which include inspection and palpation the breast in both standing and supine positions, this finding is lower than in a study done in United Arab Emirates by Sreedharan J, et al. in 2010, where 89% knew that the ideal position of body while performing breast self-examination is either standing or lying and 68.8% knew both inspection and palpation are the ideal way.<sup>22</sup> Another study done by Al-Azmy SF, et al in 2013 showed that about one third of practicing women performed six or less steps correctly out of 12.<sup>16</sup> Regarding the association between the participant's practicing BSE and their demographic characteristics; our results illustrate the highly significant association of the student's level in practicing BSE with their age ( $p$ -value $>0.000$ ). This is in agreement to a study done by Hussein MM, et al in Erbil in 2012, which clarified that there was a significant statistical relationship between the age of the study participants and their level of performing BSE, with  $p$ -value of 0.028.<sup>24</sup>

## CONCLUSIONS

Female medical students at the clinical stage showed a good knowledge and fair practicing of breast self-examination as compared to female medical students at preclinical stage. This emphasize the truth about how proper education can positively influence good level of knowledge and maybe leads to proper level of practicing BSE.

## RECOMMENDATIONS

- To activate a national program about the knowledge and practice of BSE in different media like TV, radio.
- Establishment of workshops and seminars about the knowledge and practice of BSE directed toward female

students in institutes and universities.

- Encourage establishment of BSE groups in social media like Facebook, Instagram, and Google groups to discuss different issues concerning BSE.

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