

Health Belief Model as a predictor of Self-Breast Examination Behaviors among Female Shaqra University Students

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Abstract: Breast cancer is one of the most important health problems facing women today. Breast cancer is known to be the second leading cause of cancer deaths after lung cancer in Saudi Arabia. Worldwide, breast cancer is the third most frequent cancer in the world and the leading cause of cancer mortality in women. Saudi Arabia is a country that provides free healthcare services, but the rates of breast cancer screening are very low. This contradiction between the availability of free healthcare services and Saudi women not utilizing these services necessitates an in-depth understanding of the health-related beliefs and obstacles towards breast cancer screening among women. In this study, the researcher assessed the relationship between self-breast examination behaviors and health belief model, variables were investigated using an analytical cross-sectional study and convenience sample of Shaqra university female students (400) by the Self-administered survey, Breast cancer awareness measure, and Champion health belief model. The scale measured the self-breast examination behaviors in relation to the health belief model. Correlational statistics were used to determine the relationships. The study revealed that there was a high percentage of female university students that had unsatisfactory knowledge, negative attitudes, and poor practice regarding the self-breast examination. The study recommended that breast cancer awareness programs should be conducted in Shaqra university on a regular basis and should focus on removing perceived obstacles to screening and enhancing self-efficacy among female students. Policymakers should integrate breast cancer awareness programs in the routine programs provided in all hospitals and healthcare centers.

Keywords: Health Belief Model, Self-Breast Examination, Early Detection, Breast Cancer.

1. INTRODUCTION

Breast cancer (BC) is the most frequent cancer of women in the world. It is the leading cause of female cancer-related morbidity and mortality in Saudi Arabia, breast cancer is the most common type of cancer among Saudi females and accounted for more than 25% of all newly diagnosed cancer among them [1], with the proportion of young aged-onset much higher than in the Western countries [2, 3]. It is usually present at advanced stages [4] due to lack of awareness among females for early screening. Many females miss early detection and treatment opportunities owing to a lack of information, knowledge, and awareness of breast cancer as well as cancer screening practices [5].

A significant number of women present with advanced stages of the disease due to a lack of information, knowledge, and awareness of early detection measures. Previous researches showed limited information about breast cancer early screening, and few girls performed screening for the purposes of early detection [6-7-8]. A recent research reported very low percentages of breast cancer screening among women in Kingdom of Saudi Arabia, and educational program were recommended to improve BC screening and to address the obstacles and barriers for BC screening [9].

Self-breast examination (SBE), mammography, and clinical breast examination (CBE) are considered screening methods for the early detection of breast cancer. There is controversy surrounding the efficacy of SBE in countries where mammography and clinical breast examination are readily available. Data from two large trials in China and Russia [10–11-12] did not suggest a vital effect of screening by SBE but reported increased harm in terms of the increased number of benign lesions identified and an increased number of biopsies performed, but the SBE is very important for early detection of non-benign lesions. However, in (2009), the U.S. Preventive Services Task Force concluded that there is insufficient evidence to recommend for or against teaching or performing routine self-breast examination [13]. The American Cancer Society now recommends the vital role of SBE and be reviewed with women beginning in their 20s and that the ultimate decision of whether to practice SBE be left up to the individual or the person [14].

While mammography and breast examination by the clinician and health professionals may be costly, inconvenient, and potentially embarrassing to some girls, self-breast examination (SBE) is a relatively simple, economical, and safe health-related behavior. In addition, studies have shown SBE to be correlated with the discovery of tumors in an earlier clinical stage and smaller size [15].

In the absence of the best research evidence that systematic and routine SBE reduces deaths from BC, a number of international organizations recommended that girls can feel and look for breast changes as part of general body awareness, while dressing or showering, so as to be aware of any changes from what is normal or abnormal findings for them. This terminology is known as “breast awareness (BA)” [16]. It is possible that increased breast awareness may have contributed to the decrease in morbidity and mortality from breast cancer in many countries, although uncertainty exists whether the benefits of BA outweigh the harms. Most females in the previous researches held pessimistic views and opinion about the complete curability of breast cancer (58.2 %) [17].

The Health Belief Model (HBM) has been used in several studies and researches as a theoretical framework to study SBE and other breast cancer detection behaviors [18]. The HBM has been tested, translated, and used for girls of different cultures. The model stipulated that health-related behavior is influenced by a girl’s perception of the threat formed by a health problem and by the value associated with her action to reduce that threat and fear [19]. According to the HBM scale, a girl who perceives that she is susceptible to breast cancer and that breast cancer is a serious disease would be more likely to perform regular breast examinations. Similarly, a girl who perceives fewer obstacles to SBE and more perceived benefits would be more likely to perform SBE [20]. In previous studies and researches, SBE screening was linked to perceived the benefits and risks [18, 21, 22, 23], obstacles or barriers [18, 22–24], self-confidence [18, 21, 23, 24], having information about BC [24], self-motivation [18], susceptibility and seriousness [18, 23], risk factors for BC [21, 23], level of educational [21], age characteristics [23] and regular visits to a physician [23, 24].

The health belief model (HBM) is a conceptual model that has given direction to exploring health-related behaviors. In this model, the subjective experience (perceptions and cognitions) of the individual determines whether the girl will engage in a specific health-related behavior. The health belief model six variables studied were: (perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, health motivation, and confidence) [14]. The Health Belief Model (HBM) explains health behavior as being determined by female students' beliefs or perceptions about the disease, and the strategies available to an individual to reduce the occurrence of the disease [15].

Since SBE seems to be so easy and convenient, it might be expected that most girls would readily use this simple screening exam. However, the National Health Interview Survey (NHIS) reported that although 92% of women have heard of SBE, only about 29% of women practice SBE monthly (National Center for Health Statistics, 2019) [16]. The United States Department of Health and Human Services, (2018) reports nine out of ten women do not know how to do a self-breast examination correctly. Nurses, as advocates of disease prevention and health promotion, are in a unique position to teach SBE techniques and to encourage routine SBE. However, few studies have examined the practice of SBE among female students and their health beliefs related to breast cancer [17]. In Kingdom of Saudi Arabia, (43.4%) identified SBE as a screening method but 67.6% never done or practiced SBE [27].

In Kingdom of Saudi Arabia (KSA), although some studies were conducted on SBE [17, 25, 26], yet none of these studies investigated girl's perceptions using the HBM. This study was designed to study the behaviors towards breast cancer and BSE among female college students, using the HBM, through the following: 1) evaluation of female’s beliefs and attitudes surrounding breast cancer and self- breast examination using the health belief model, 2) determination of the

level of knowledge among female students regarding breast cancer and breast cancer-related practices, 3) determination of breast cancer-related screening behaviors and 4) identification of risk factors influencing the practice of SBE. The results of this study will provide baseline assessment data for future intervention programs to promote early detection, early screening, and early management of BC. Health motivation, confidence, perceived benefits, and obstacles for SBE were significantly associated with the regular practice of SBE. An increase in girls' health sensitization and motivation of girls about the importance and benefits of SBE is suggested to increase the adoption and practice of SBE [28].

1.1 Significance of the problem

Breast cancer has been considered a major health problem among females because of its high incidence in the recent years. SBE is one of the most important methods for the early diagnosis of breast cancer. 95% of all breast cancers can be diagnosed in the primary stage by SBE [29]. Unfortunately, despite the relative benefits of regular SBE, few female students actually examine themselves. In fact, the majority does not even know how to do an SBE [30]. An analytical cross-sectional research was carried out among (262) female undergraduate students at Putra University in Malaysia. The study showed that only 36.6% of girls performed SBE monthly [31]. All university students were at a stage where it was important to carry out SBE on a regular basis to feel any changes early [32]. The study focused on medical students as they are future health care providers. They will play an important role in raising awareness of the community about the early detection of breast cancer as they usually have close contact with female patients [33]. Also, positive attitudes can be developed by young adults towards the self-breast examination. This contributes to early breast cancer detection as well as reducing late breast cancer presentation. Thus, not only should young students learn more about SBE, but they also play an important role in teaching their mothers, sisters, and friends to examine their breasts in KSA, studies related to knowledge, attitudes, and practices around breast cancer are scarce [34]. So, the aims of this study are to assess female college students' to breast cancer screening beliefs and practices based on the Health Belief Model and evaluate self-efficacy with breast cancer screening behaviors of female college undergraduate students in Shaqra University. The results of this study will provide a baseline assessment data for future intervention programs to facilitate early detection and early management of breast cancer among Saudi females.

2. OBJECTIVES

The purpose of this study is to:

- Examine the association between the Health Belief Model variables and the frequency of breast self-examination among Shaqra university students in the early detection of breast cancer and risk prevention.
- Study the perception and practice towards breast cancer and SBE among female college students, using the HBM, through the following: 1) assessment of student's beliefs and attitudes surrounding breast cancer and self-breast examination, 2) determination of the level of knowledge among female university students regarding breast cancer and breast cancer-related practices, 3) determination of breast cancer-related behaviors, and 4) identification of factors influencing the practice of SBE.
- Increase the student's awareness about the importance of early detection of breast cancer by the self-breast examination (SBE) and early detection and prevention of breast cancer.

3. RESEARCH QUESTIONS

At the end of the study, the researcher will answer the following question:

Health belief model can predict self-breast examination behavior among female Shaqra University students?

4. RESEARCH METHODOLOGY

4.1 Design:

This was an analytical cross-sectional study using a self-administered questionnaire.

4.2 Sample:

A Convenience sampling technique was used to recruit participants of female students at Shaqra University.

Sample size:

To arrive at the sample size, we used the formula of a single proportion $N = Z\alpha^2 P(1-P)/d^2$ where:

N = sample size

$Z\alpha = 1.96$ for 95% confidence level

P = 58.2% (7)

D = (5%)

The calculated sample size for the present study was (374). To account for missing data, we included (400) participants.

Inclusion criteria

- All female students of Shaqra University of their ages from 18- 22 years old who gave written consent and were willing to participate in the study were included.

Exclusion criteria

- Students who were absent, not willing to participate, and who have not given written consent were excluded.

4.3 Setting:

Colleges of the Shaqra University , Al-Quwayiyah. The study was conducted between October and December 2021

4.4 Tools for Data Collection:

1- A self-administered questionnaire: For knowledge, attitude, behaviors, and practice for the students towards self-breast examination. The questionnaire was designed by the researcher to get information on socio-demographic and medical background. The content of the questionnaire was validated by 3 experts of different expertise, based on their opinion and suggestions. The questionnaire was distributed electronically by emails and what's up applications to the students.

2- Breast cancer awareness measure (BCAM): Breast CAM used to measure female's knowledge about BC and screening, it developed by Elobaid et al, (2014) [36]. It consists of 4 subscales and 33 questions with various themes i.e., screening method (5 questions), breast cancer (5 questions), warning signs and symptoms (7 questions), and risk factors and health behaviors (12 questions). It was 3 Likert scale answer (yes, no, I don't know), knowledge in this scale is scored based on the number of true answers. The scale has done on the Google form and distributed electronically to the students by the researcher.

3- The champion health belief model (CHBM): Is a standard instrument widely used in many different cultures. It is translated into many languages [35,37,38]. Was used to examine the influence of health beliefs of female students over BSE practice. The Champion's Health Belief Model Scale was developed by Champion in 1984 and revised in 1993, 1997, and 1999 (Champion, 1984; 1993; 1997; 1999; Champion and Menon, 1997). The CHBMS consists of 6 concepts and 42 items: 1) Perceived susceptibility to an illness (3 items); 2) Perceived seriousness of the illness (7 items); 3) Perceived benefits of certain actions (4 items); 4) Perceived barriers for the action (11 items); 5) Confidence in one's ability (10 items); and 6) Health motivation (7 items). Each item has a score ranging from 1 to 5: "I strongly disagree" (1 point), "I disagree" (2 points), "I am not sure or neutral" (3 points), "I agree" (4 points), "I strongly agree" (5 points). The score of each subscale is considered separately and is not merged into a single total score of all the subscales of the scale. Females who had low scores in the barrier subscale and high scores in the other subscales also held positive beliefs and attitudes about breast cancer and SBE practice determined that the Cronbach alpha coefficients of the subscales ranged from 0.58-0.89. A reliability test for both the scales was performed through a pilot study on 50 female students and Cronbach Alpha was calculated to assess the internal consistency. Alpha value for various subscale of CHBM was as below Seriousness: 84%, Susceptibility: 83%, Health motivation: 81%, Confidence: 83.1%, SBE benefits: 82%, SBE barriers: 82.5%. The alpha value for breast CAM was 78%. The questionnaire consists of 42 items addressing the variables of the HBM. Five questions examine perceived susceptibility; seven questions for perceived seriousness; six questions for perceived benefits; six questions for perceived barriers; eleven questions for confidence; and seven

questions for health motivation. The model is done on the Google form and distributed electronically by the Emails and What's up application to the students by the researcher.

4.5 Ethical considerations:

The study was approved by the scientific research ethics committee at Shaqra University. All students instructed that all the information used only for the purpose of the scientific research, and students privacy and confidentiality were ensured. Written consent was signed by all the participants after we explained the nature and purpose of the study.

5. STATISTICAL ANALYSIS

The data compilation, management, and analysis were done by using Statistical Package for the social sciences (SPSS) program version 21.0. Descriptive and inferential statistical tests were applied to the data.

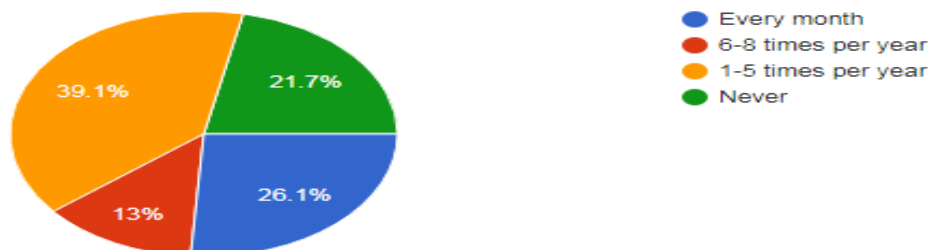
6. RESULTS

Figure (1): Distribution of the study sample according to type of the college



Most of the participants from the Applied Medical Sciences College with percentage of 82.6% (83%).

Figure (2): Distribution of the study sample according to the frequency of self-breast examination



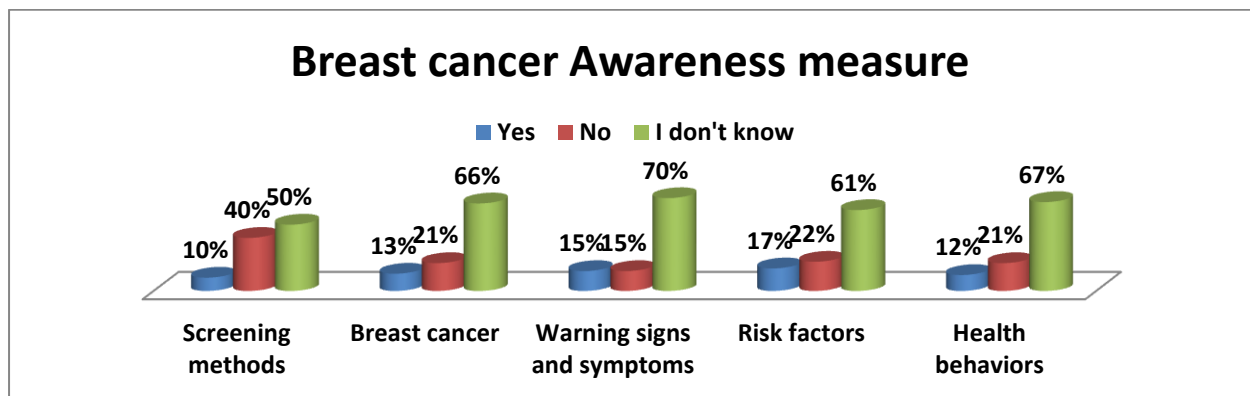
39% of the participants examine their breast 1-5 times per year. 22% never examine their breast. Less than one-third of the participants 26% examine their breast every month.

Figure (3): Distribution of the study sample according to source of learning self-breast-examination (SBE)



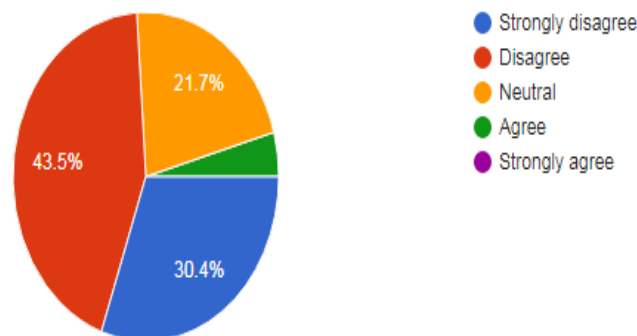
26% of the participants taught self-breast examination by the physician, more than one-third of the participants 39% taught it by the nurse, 13% taught it by the brochure, and 22% taught it by the mass media.

Figure (4): Distribution of the study sample according to breast cancer awareness measure



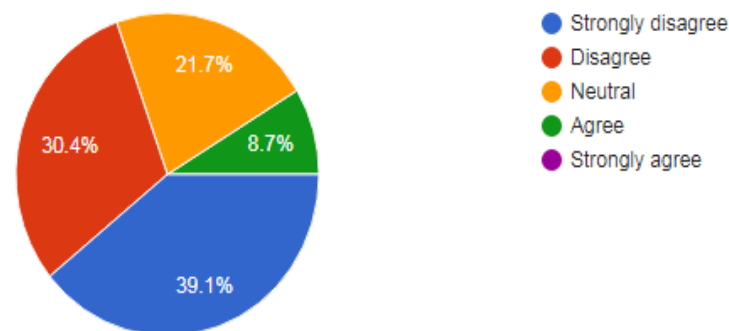
50%, 66%, 70%, 61%, and 67% of the participants do not know about screening methods, breast cancer, warning signs& symptoms, risk factors, and health behaviors respectively.

Figure (5): Distribution of the study sample according to perceived susceptibility (they feel that they will get breast cancer in the future)



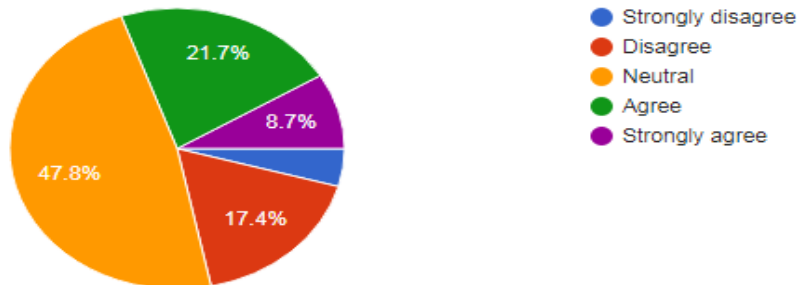
43.5% of the study participant were disagreed and 4.4% of them were agreed about they feel that they will get breast cancer in the future.

Figure (6): Distribution of the study sample according to perceived susceptibility (their chances of getting breast cancer are great)



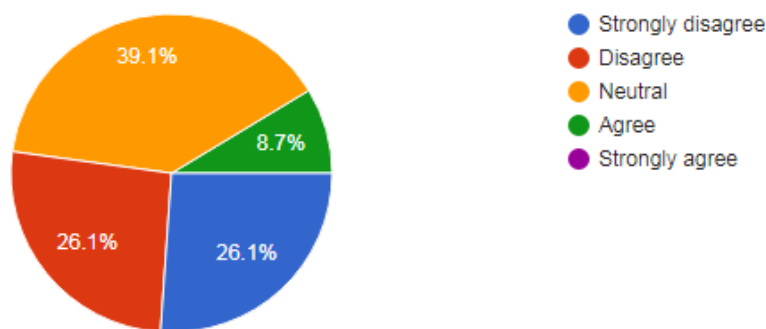
30.4% of the study participant were disagreed, 39.1% of them were strongly disagreed, 21.7% were not sure, and 8.7% of them were agreed that their chances of getting breast cancer are great.

Figure (7): Distribution of the study sample according to perceived seriousness (their thoughts of breast cancer scares them)



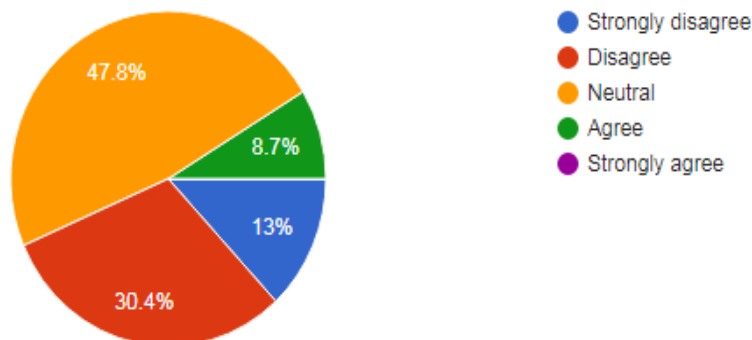
21.7% of the study participants were agreed and 8.7% were strongly agreed about the thoughts of breast cancer scares them.

Figure (8): Distribution of the study sample according to perceived seriousness (when they think about breast cancer, their heart beats fast)



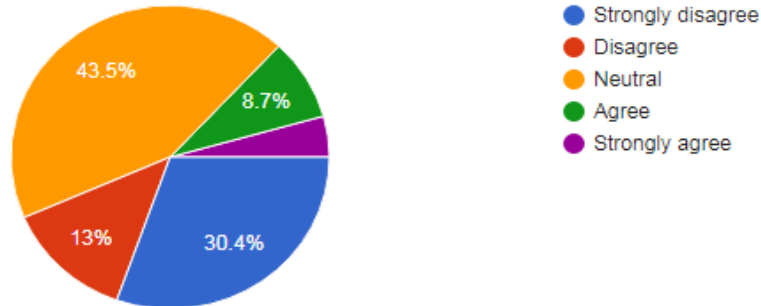
8.7% of the study participants' heart beats fast when they think about breast cancer.

Figure (9): Distribution of the study sample according to perceived seriousness (the problems that they would experience with breast cancer would last a long time)



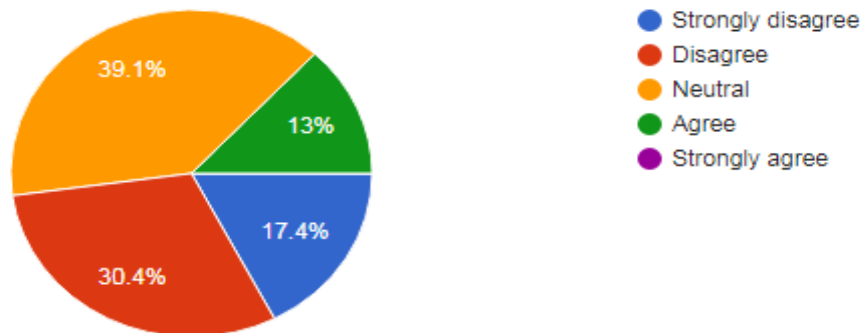
47.8% were not sure, 30.4% were disagreed, and 8.7% of the study participants were agreed about the problems that they would experience with breast cancer would last a long time.

Figure (10): Distribution of the study sample according to perceived seriousness (breast cancer would threaten a relationship with their husbands)



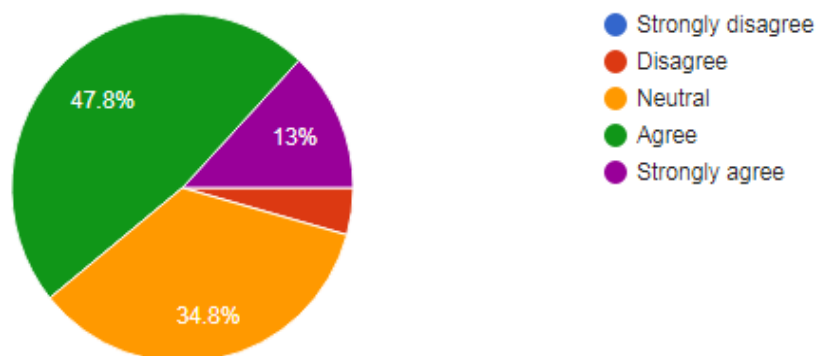
43.5% were not sure, 30.4% were strongly disagreed, 8.7% were agreed, and 4.4% of the study participants were strongly agreed about breast cancer would threaten the relationship with their husbands.

Figure (11): Distribution of the study sample according to perceived seriousness (if they developed breast cancer, they would not live longer than five years)



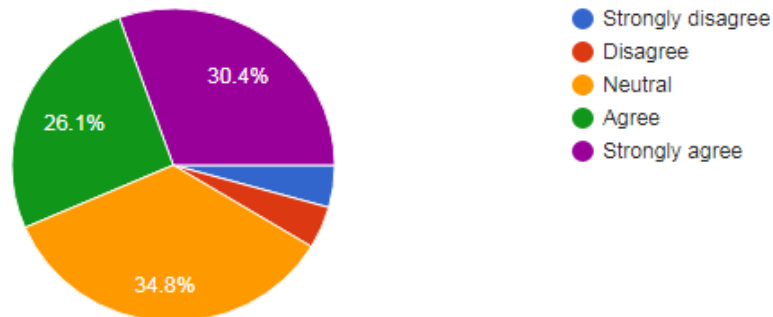
39.1% were not sure, 30.4% were disagreed, 17.4% were strongly disagreed, and 13% of the participants were agreed about if they developed breast cancer, they would not live longer than five years.

Figure (12): Distribution of the study sample according to perceived benefits (when they do self-breast examination, they feel good about themselves)



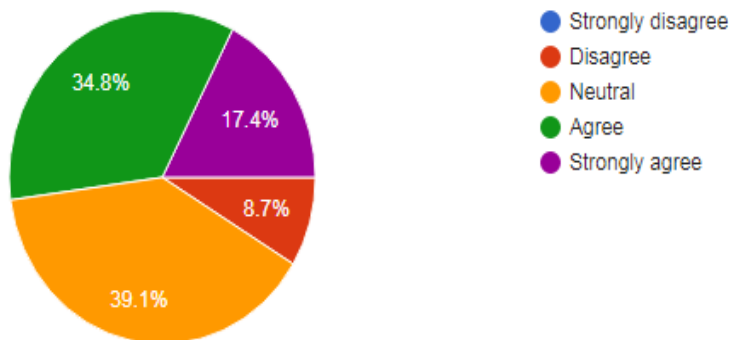
47.8% were agreed, 34.8% were not sure, 13% were strongly agreed of the participants about they felt good about themselves when they do breast self-examination.

Figure (13): Distribution of the study sample according to perceived benefits (completing SBE each month will allow them to find lumps early)



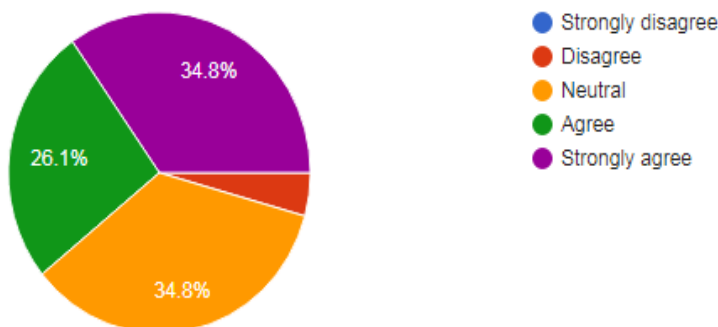
34.8% were not sure, 30.4 % were strongly agreed, 26.1% were agreed, and 8.7% of the participants between strongly disagreed and disagreed about completing SBE each month will allow them to find lumps early.

Figure (14): Distribution of the study sample according to perceived benefits (monthly completing SBE will decrease their chances of requiring radical or disfiguring surgery if BC occurs)



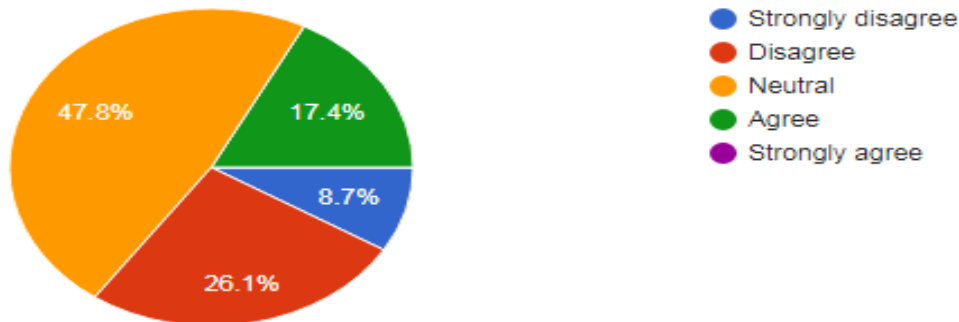
39.1% were not sure, 34.8 % were agreed, 17.4% were strongly agreed, and 8.7% of the participants were disagreed about monthly completing SBE will decrease their chances of requiring radical or disfiguring surgery if BC occurs.

Figure (15): Distribution of the study sample according to perceived benefits (monthly completing SBE will decrease their chances of dying from breast cancer)



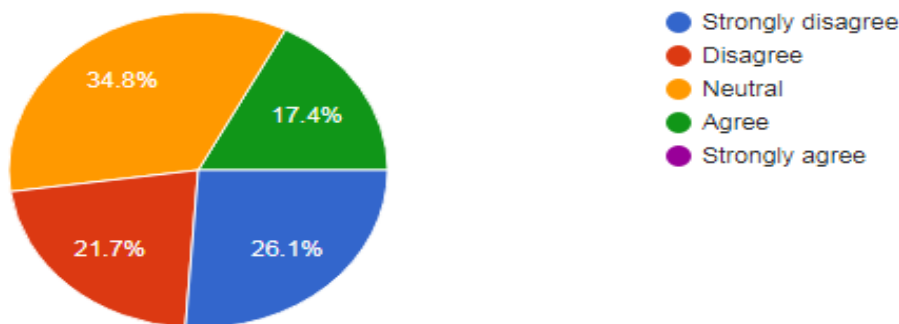
34.8% were not sure, 34.8 % were strongly agreed, 26.1% were agreed, and 4.3% of the participants were disagreed about monthly completing SBE will decrease their chances of death from BC.

Figure (16): Distribution of the study sample according to perceived benefits (they feel funny doing Self-Breast Examination)



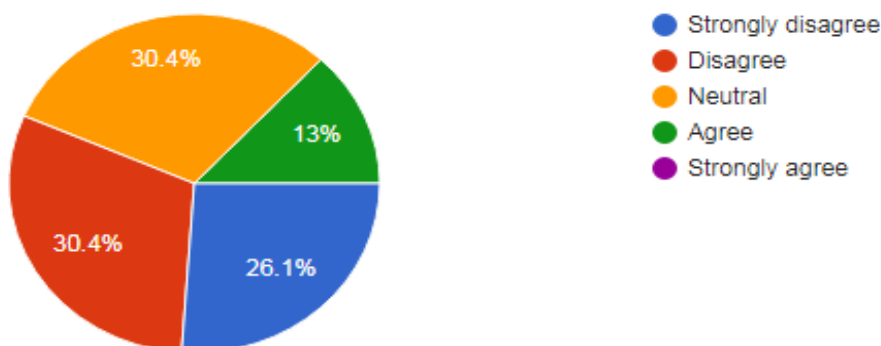
47.8% were not sure, 26.1 % were disagreed, 17.4% were agreed, and 8.7% of the participants were strongly disagreed about they feel funny doing SBE

Figure (17): Distribution of the study sample according to perceived barriers (SBE will be embarrassing to them)



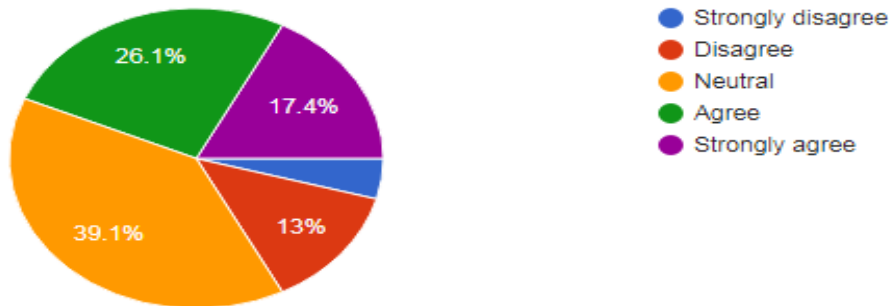
34.8% were not sure, 21.7 % were disagreed, 26.1% were strongly disagreed, and 17.4% of the participants were agreed about SBE will be embarrassing to them. (more than half of the participants, SBE will be embarrassing to them)

Figure (18): Distribution of the study sample according to perceived barriers (have enough privacy to do SBE)



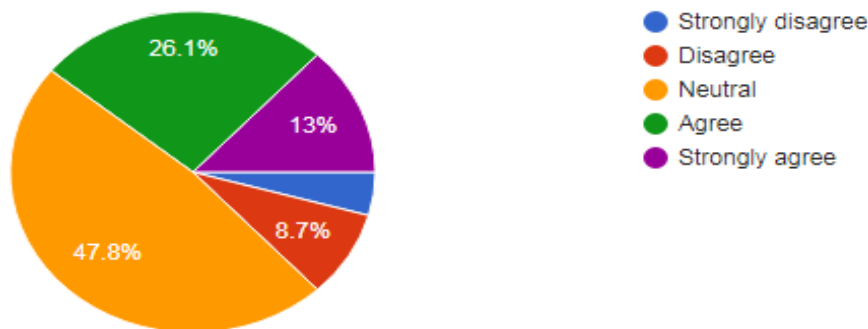
30.4% were not sure, 30.4 % were disagreed, 26.1% were strongly disagreed, and 13% of the participants were agreed about having enough privacy to do SBE. (less than half of the participants did not have enough privacy to do SBE).

Figure (19): Distribution of the study sample according to perceived barriers (know how to perform SBE)



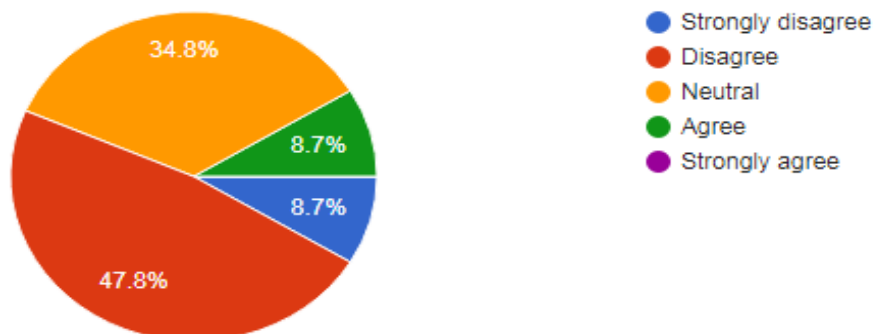
39.1% were not sure, 26.1 % were agreed, 17.4% were strongly agreed, and 13% of the participants were disagreed about knowing how to do SBE. (More than half of the participants did not know how to perform SBE).

Figure (20): Distribution of the study sample according to perceived barriers (they are confident to perform SBE correctly)



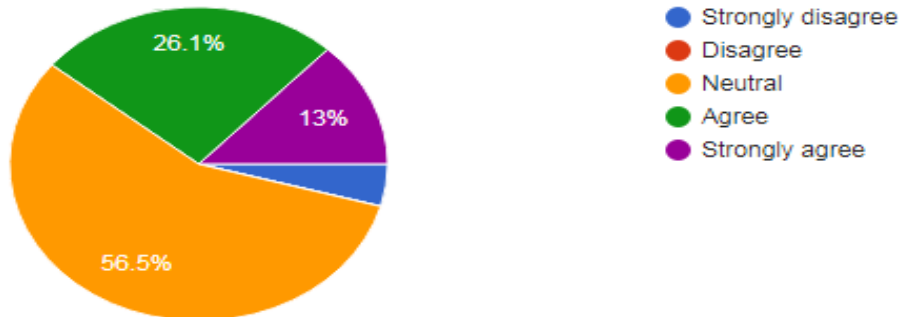
47.8% were not sure, 26.1 % were agreed, 13% were strongly agreed, and 8.7% of the participants were disagreed about they are confident to perform SBE correctly (More than half of the participants were not confident to perform SBE).

Figure (21): Distribution of the study sample according to perceived barriers (doing SBE during the next year will make them worry about BC)



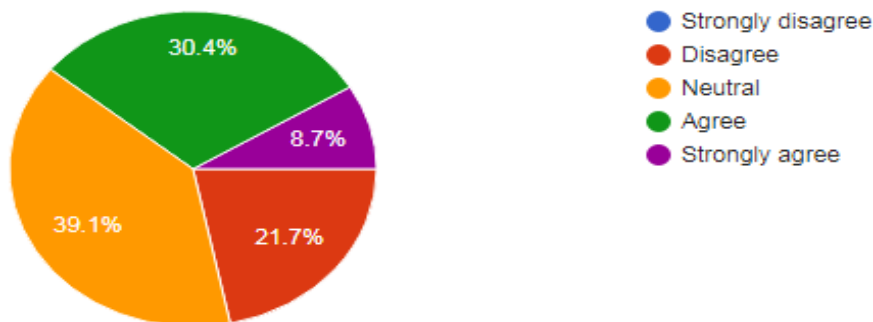
47.8% were disagreed, 34.8 % were not sure, and the same percentage 8.7% for strongly disagreed and agreed respectively about doing SBE during the next year will make them worry about BC.

Figure (22): Distribution of the study sample according to self-efficacy (they were sure of the steps to follow for doing SBE)



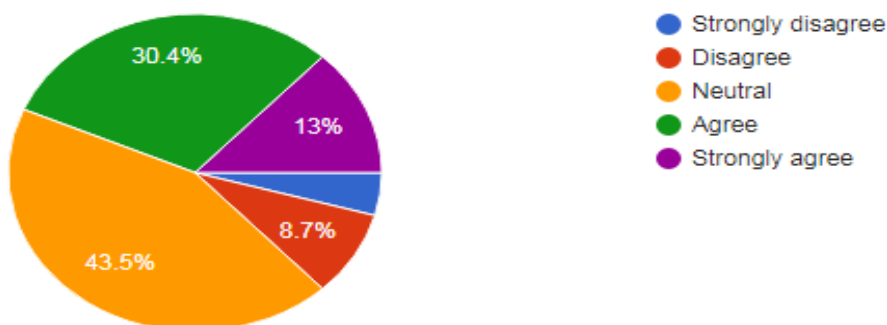
56.5% were not sure, 26.1 % were agreed, and 13% were strongly agreed of the participants about they were sure of the steps to follow for SBE (More than half of the participants were not sure of the steps to follow for doing SBE).

Figure (23): Distribution of the study sample according to self-efficacy (they were able to identify normal and abnormal breast tissue when they do SBE)



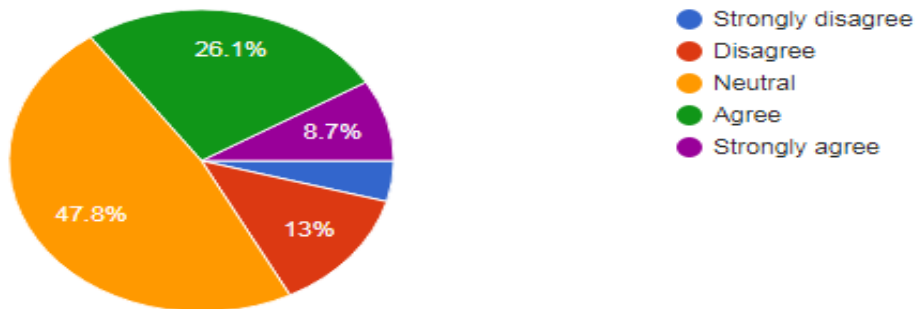
39.1% were not sure, 30.4 % were agreed, 21.7% were disagreed, and 8.7% of the participants were strongly agreed about they were able to identify normal and abnormal breast tissue when they do SBE.

Figure (24): Distribution of the study sample according to self-efficacy (when looking in the mirror, they can recognize abnormal changes in their breasts)



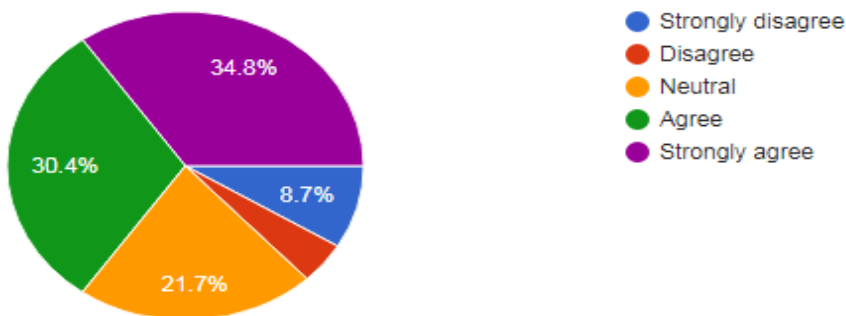
43.5% were not sure, 30.4 % were agreed, 13% were strongly agreed, and 8.7% of the participants were strongly disagreed about they can recognize abnormal changes in their breasts when they looking to the mirror. (more than half of the participants cannot recognize abnormal changes in their breasts, when they looking in the mirror)

Figure (25): Distribution of the study sample according to self-efficacy (they can use the correct part of their fingers when they examine their breasts)



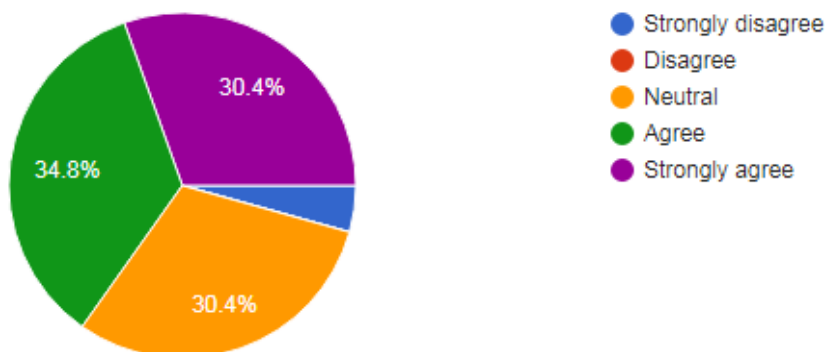
47.8% were not sure, 26.1 % were agreed, 13% were disagreed, and 8.7% of the participants were strongly agreed about they can use the correct part of their fingers when they examine their breasts.

Figure (26): Distribution of the study sample according to health motivation (they want to discover health problems early)



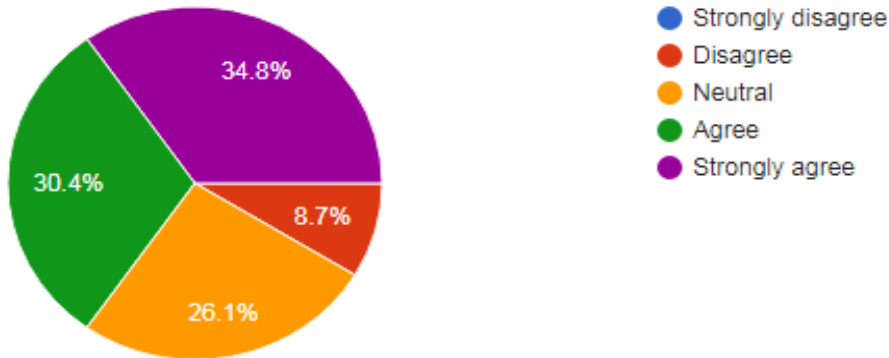
30.4% were agreed, 34.8% were strongly agreed, 21.7 % were not sure, and 8.7% of the participants were strongly disagreed about they want to discover health problems early.

Figure (27): Distribution of the study sample according to health motivation (maintaining good health is extremely important to them)



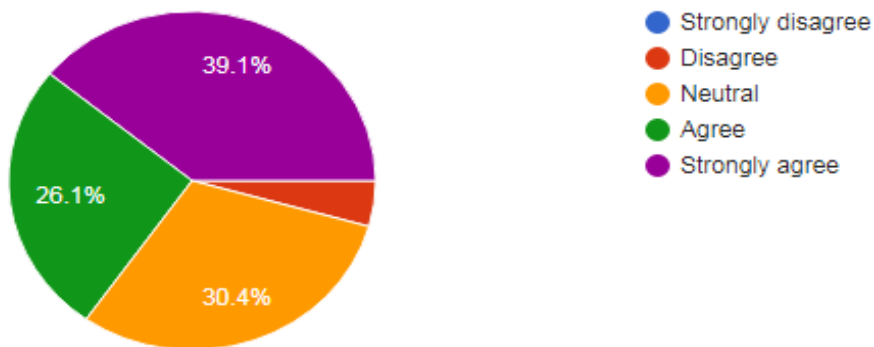
34.8% were agreed, and the same percentage of the study sample 30.4% were not sure and strongly agreed respectively about maintaining good health is extremely important to them.

Figure (28): Distribution of the study sample according to health motivation (searching for new information to improve their health)



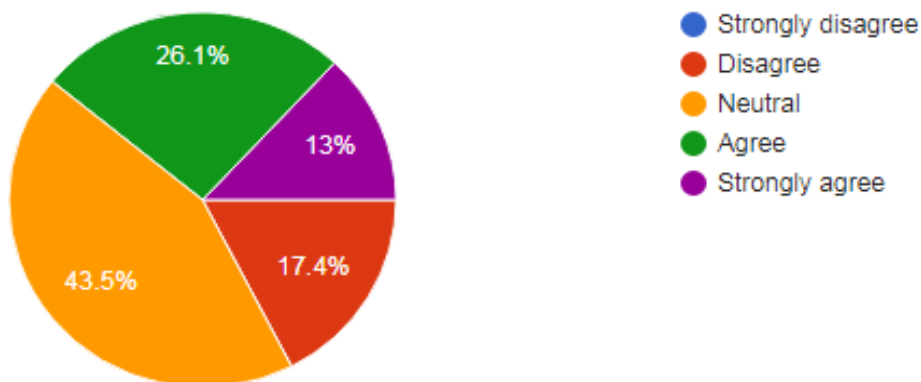
30.4% were agreed, 26.1% were not sure, 34.8% were strongly agreed, and 8.7% of the participants were disagreed about searching for new information to improve their health.

Figure (29): Distribution of the study sample according to health motivation (feeling that it is important to carry out activities which will improve their health)



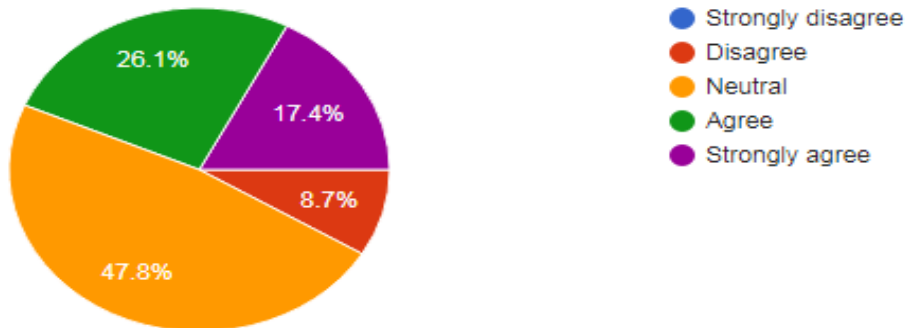
39.1% were strongly agreed, 30.4% were not sure, and 26.1% were agreed of the participants about their feeling that it is important to carry out activities which will improve their health.

Figure (30): Distribution of the study sample according to health motivation (eating well-balanced meals)



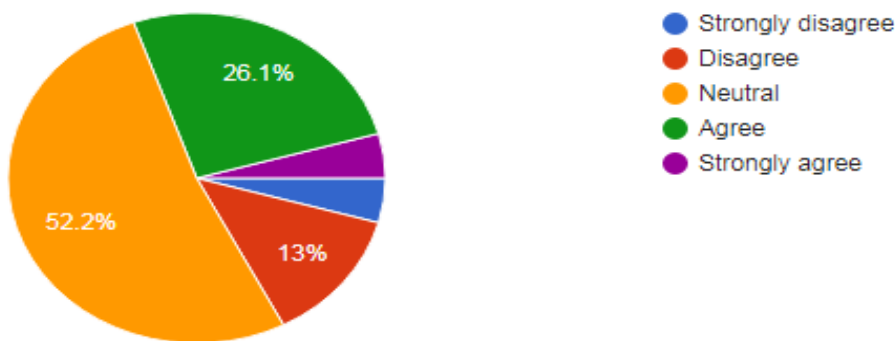
43.5% were not sure, 26.1% were agreed, 17.4% were disagreed, and 13% of the participants were strongly agreed about eating well-balanced diet.

Figure (31): Distribution of the study sample according to health motivation (exercising at least three times a week)



47.8% were not sure, 26.1 % were agreed, 17.4% were strongly agreed, and 8.7% of the participants were disagreed about exercising three times a week.

Figure (32): Distribution of the study sample according to health motivation (having regular check-ups even when they not sick)



52.2% were not sure, 26.1 % were agreed, and 13% were disagreed of the study participants about having regular check-ups even when they not sick.

7. DISCUSSION

In Saudi Arabia, female breast cancer (BC) was the most common cancer among Saudi women for 14 consecutive years, from 1994-2007, as per the report of the Saudi Cancer Registry [39]. Breast cancer is commonly presented at a relatively young age and with an advanced stage of the disease. This could be due to a lack of awareness, and knowledge and due to certain beliefs about breast cancer and its management among females. Breast health awareness appears to be the opportunistic, a pragmatic and simple tool that can play an important role in the detection of early breast cancers with a favorable prognosis [40]. In addition, performing self-breast examination (SBE) can detect 40% of breast lesions [41]. The aim of the present study was to examine the association between the health belief model variables and the attitude and practice of SBE among female Shaqra university students in the early detection of breast cancer and risk prevention and evaluate their compliance with breast cancer screening behaviors.

Regarding the students' sources of teaching about the self-breast examination, the present study indicated that more than one-third of the participants (39%) were taught by the nurse, 26% were taught by the physician, 22% were taught by audio visual media, and 13% were taught by pamphlet and brochure. These results were opposite of the study of *Hoda et al,(2016)* [47], which illustrated that audio visual media was the most common source of information about self-breast examination and breast cancer in their study.

Regarding breast awareness and the frequency of the students' performance for self-breast examination (SBE), the study results showed that 50%, 66%, 70%, 61%, and 67% of the participants do not know about screening methods, breast

cancer, warning signs & symptoms, risk factors, and health behaviors respectively. So, more than one-third 39% of the study participants examined their breast by self-breast examination 1-5 times every year, 26% made it monthly, and 22% never made it. These results related to lack of knowledge and awareness about the importance of making self-breast examination for early detection of breast cancer, in the same way, *Myint et al, (2020)* [42] concluded that Myanmar women were inadequate in information, believes, attitude, and practice regarding SBE and breast cancer and they need a greater understanding of breast cancer to increase their confidence to make monthly SBE. These results was also supported by *Esaac et al, (2020)* [43] which concluded that less than a quarter of the participants performed SBE at least once a month. This may be due to their insufficient knowledge, their false sense of insusceptibility, and most importantly their low self-efficacy to perform SBE. On the same line, *Jamal et al, (2019)* [44] supported these findings which illustrated a few numbers of women perform SBE regularly every month. These results due to inadequate knowledge among female Shaqra university students.

Regarding perceived susceptibility and seriousness of the health belief model, half of the study sample were natural or not sure regarding the thoughts of breast cancer scares them and 39% of the sample were natural also regarding their heartbeats fast when they think about breast cancer, besides 43% of the participants were natural about that breast cancer would threaten a relationship with their husbands, but 9% of the study sample were agreed about their chances of getting breast cancer are great. These findings was in concordance with *Khiyali, Aliyan, and Kashf (2017)* [45] which concluded that information is the essential requirement to change behaviors and the understandings of breast cancer and SBE among females. These results are also congruent with *Asiyeh Pirzadeh (2018)* [46] which concluded that few Iranian female university students were in the action and maintenance stages of self-breast examination and had inadequate information regarding the risk factors for breast cancer and lower susceptibility and seriousness.

According to the perceived benefits of the health belief model, half of the study sample felt good when they did SBE, 26% agreed about completing SBE each month will allow them to find lumps early and will decrease the chances of dying from breast cancer (BC), and 35% agreed about monthly completing SBE will decrease their chances of requiring radical or disfiguring surgery if BC occurs. These perceived benefits are congruent with *Noor et al., (2018)* [47] which concluded that the Indonesian female heard about SBE from different sources and accepted that they should palpate the breast to find the breast lumps early.

According to perceived barriers of the health belief model, 17% of the study sample were agreed about SBE will be embarrassing to them, 26% of the participants were strongly disagreed about having enough privacy to do SBE and more than half of the study participants did not know how to perform SBE. Similarly, another study by *Myint et al, (2020)* [42] showed that the Myanmar women had a negative attitude toward SBE with embarrassment to do it and not having enough privacy to do SBE. These results was congruent also with *Fatemeh et al,(2018)* [48] which found that there was a meaningful relationship between SBE with perceived benefits and barriers and recommended that the educational programs should base on the perceived barriers and obstacles to do SBE.

Regarding cues to the action or self-efficacy of the health belief model, half of the study sample were not confident to perform SBE correctly, 39% of the participants did not know how to perform SBE, and more than half of the study participants were not sure of the steps to follow for doing SBE, 39% of the participants were not able to identify normal and abnormal breast tissue when they do SBE, besides 43% of the study sample when looking in the mirror, they cannot recognize abnormal changes in their breasts, and 48% of the participants cannot use the correct part of their fingers when they examine their breasts. These results were supported by *Hoda et al,(2016)* [49], which concluded that there was a high percentage of female university students that had unsatisfactory knowledge, negative attitude, and poor practice regarding self-breast examination (SBE) and breast cancer, and they recommended that target population awareness and positive attitudes towards Perceived benefits of early breast cancer screening should be increased. These results are in accordance also with *Esaac et al, (2020)* [43] which concluded that knowledge levels were just about moderate among the sample and these findings were worrying because university students are often seen as agents of change.

Regarding health motivation of the health belief model, more than one-third of the study participants were strongly agreed about they want to discover the health problems early (35%), searching for new information is very important to improve their health (35%), and feel it is important to carry out activities which will improve their health (39%). One-third of the study sample were strongly agreed about maintaining good health is extremely important to them. These

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results reflect the positive health motivation. Besides 26% of the study participants agreed about the importance of eating well-balanced diet, practicing exercises at least three times a week, and regular checking-up. These results related to 83% of the study participants from the medical applied colleges and the health motivation and disease prevention were important to them and they had good knowledge about it. These results are in accordance with *Mostafa et al,(2015)* [50], which illustrated that SBE performance was directly associated with higher scores of self-confidence and health motivation in the health belief model.

8. CONCLUSION

Based on the results of the present study, it can be concluded that there was a high percentage of students who had unsatisfactory knowledge, negative attitude, and poor practice regarding self-breast examination and breast cancer. Although most Shaqra university students agreed that self-examination would result in early diagnosis and detection of the disease, only less than one-thirds of the subjects had SBE monthly. These are real barriers to perform self-breast examination. Healthcare authorities and providers should develop a formal health education program based on the perceived barriers for the university colleges on BC and SBE. Because the more the female understands about BC and SBE, the earlier they detect breast cancer. So, health belief model can predict self-breast examination behavior among female Shaqra University students.

9. RECOMMENDATION

Based on the results of the study, the researcher recommended that:

- Breast cancer awareness programs should be conducted in the universities on a regular basis and should focus on removing perceived barriers such as fears from the examination for early screening and enhancing self-efficacy among female university students.
- Policymakers should integrate breast cancer awareness programs in the routine programs provided in all healthcare centers and hospitals.
- Attention should be paid to barriers to women undergoing mammography, such as costs, shame, embarrassment, and accessibility.
- Target population awareness and positive attitudes towards the benefits of early breast cancer screening should be increased.

Limitations of the Study

The researcher identify that because questionnaires were self-administered, she had not present to assess female university students ability to correctly perform SBE where they reported knowing how to do it. The researcher therefore suggest that future studies should observe a demonstration of the actual performance of SBE by female university participants to verify if they possess the skill to perform SBE.

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