

Nutrition Knowledge, Attitude, Practice towards Breast Cancer Prevention among the Female Students of University of Hail, Saudi Arabia

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ABSTRACT

Objective: There are limited studies conducted in Saudi Arabia to assess the Nutrition knowledge, attitude, and practice towards prevention of breast cancer among the female students of Hail University. The purpose of the study was to assess the knowledge, attitudes, and practices related to nutrition and breast cancer prevention among university students. The study aims at the following objectives:

1. To assess university students' nutrition knowledge, attitude and practice towards breast cancer.
2. To compare the Nutrition knowledge, attitude, and practice (KAP) towards breast cancer between science and non-science students of the university.

Material and Methods: A cross-sectional survey was planned to assess nutrition knowledge, attitudes, and practice (KAP) towards breast cancer prevention among students of University of Hail. The subjects were surveyed through a previously standardized self-administered questionnaire for questions related to nutrition knowledge, attitudes, and practice on the prevention of breast cancer. In addition, self-reported weight and height data were collected, and body mass index was calculated. The statistical analysis was done using Statistical Package for Social Sciences software (version 18.0).

Results: The general knowledge on nutrition was self-perceived by the study population. 14.8% of the population perceived that they have a very good knowledge of nutrition, about 66.7% of the population has an average or good knowledge. From the viewpoint of attitude among the study samples, it was clear that science students have a better attitude when compared to non-science students. The results were statistically significant ($P < 0.05$) for the practice of exercise, consuming fruits and vegetables, and drinking green tea showing a higher number among science students than non-science students.

Conclusion: In conclusion, nutrition KAP towards BC prevention was found to be influenced by factors such as age, the field of study, and familial history of BC. These results further support the hypothesis that having proper nutritional knowledge improves an individual's eating practice, reducing the risk of any nutrition-related cancers such as BC. These findings must be considered when designing breast health education programs. To successfully design, organize, and implement nutrition education programs in institutions that promote an increased understanding of nutrition, ultimately improving individuals' dietary habits and lifestyle.

Keywords: Nutrition; Knowledge; Attitude; Practice; Lifestyle.

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INTRODUCTION

Breast cancer (BC) has a high prevalence rate in the world, with an increasing trend in recent decades. Breast cancer is the most common cancer in women both in the developed and less developed world. It is estimated that worldwide over 508 000 women died in 2011 due to breast cancer (Global Health Estimates, WHO 2013) (1). Although breast cancer is considered a disease of the developed world, almost 50% of breast cancer cases and 58% of deaths occur in less developed countries (GLOBOCAN 2008). Almost one in eight women worldwide will develop breast cancer during their lifetime, and breast cancer is the leading cause of cancer deaths among women (2).

In 2018, an estimated of 266,120 new cases of invasive BC are expected to be diagnosed in the U.S. (3). It is noteworthy that in the United States, the majority of breast tumors occur in women under the age of 40. (4). Breast cancer is a common malignancy among Saudi females, with a prevalence of 21.8%. In Saudi Arabia, the International Agency for Research on Cancer estimated that the age-standardized incidence rate (ASIR) for breast cancer was 22.4 per 100,000 women in 2008, and the age-standardized mortality rate was 10.4 per 100,000 women (5). The most recent survey of cancer-related mortality among Saudi women finds that breast cancer is the ninth leading cause of death (6, 7, and 8). Al-Qahtani (9) reports that breast cancer is the second most common malignancy in Saudi women. Ibrahim et al. (10) 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 breast cancer cases 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 risk factors (8,9). Anders et al. (11) find that in the US, approximately 7% of women with breast cancer are diagnosed before age 40, and survival rates for these women are worse than for those diagnosed at older ages. Early diagnosis is an important issue among young Saudi women. The 2002 annual report of Saudi National Cancer Registry shows that breast cancers that develop before age 40 comprise 26.4% of all female breast cancers in Saudi Arabia, compared with 6.5% in the United States.

Alcohol and tobacco use, obesity, physical inactivity, and oral hormonal contraceptive use are considered as modifiable risk factors for BC (12,13). The unhealthy dietary pattern has been reported to increase the risk of BC developing (14–16). One of the reasons for the high incidence of BC in Hail could be the increasing adoption of a Western dietary pattern (16,17). A healthy dietary pattern plays a significant role in the prevention and treatment of various disorders, including cardiovascular diseases and cancer (18, 19).. It has been postulated that nearly 35% of cancer-related deaths can be prevented by following an appropriate diet (20). There exists a considerable body of literature on the role of dietary factor

Knowledge, attitudes, and practice (KAP) about a disease can significantly affect health care-seeking behavior and prevention. Nutritional recommendations can educate a large number of young adults in the university (21). It has been observed that the risk of chronic diseases could be reduced when positive changes have been made in the dietary habits among university students (22). Thus, identifying dietary risk factors that are associated with an increased risk of breast cancer can have a positive impact on dietary behaviors and ultimately help prevent the incidence of breast cancer. Medical universities have a key role in motivating the community, and identifying major shortcomings is necessary in the process. The early detection of BC not only guarantees an increase in the survival rate but also guarantees an improvement in the quality of life and costly treatments. To achieve this, it is important that health professionals, especially medical students, be especially aware of the BC's pathogenesis and the nutritional factors related to BC. As there is no comprehensive study about nutrition-related BC

prevention KAP in Hail, our study attempts to fill this gap in the literature. Hence, this study assessed the KAPs regarding BC among female university students in Hail city. Certainly, assessing KAP toward the role of nutrition in BC prevention in this population is essential for planning public health programs. Not only our study aimed to provide baseline information about KAP of nutrition-related BC prevention factors among university students in Hail, but also to examine the correlation between demographic characteristics and nutrition KAP for BC prevention.

MATERIALS AND METHODS

Subjects: A cross-sectional study of 405 undergraduate students were randomly selected from the age group of 17 to 25 years from the University of Hail, Hail, Kingdom of Saudi Arabia. All the students from different faculties were invited voluntarily to participate in the study.

Questionnaire: A structured questionnaire was designed containing about 34 core questions. It included questions on anthropometric, basic sociodemographic, and general nutrition knowledge relating to BC. The questionnaire highlights on 12 questions on the level of nutrition knowledge, 6 questions on attitudes, and 6 questions on the practice of nutrition labeling. The questionnaire was reviewed and a pilot study was done before finalizing and distributing to the samples.

Validation of the Questionnaire: For content validity (back to back translation), the questionnaire was initially translated into Arabic and then converted back to English and pre-tested for question accuracy and clarity.

Data Collection: The students voluntarily completed a self-administered questionnaire to assess nutrition KAP on BC prevention. To determine whether obesity is a prominent risk factor among the population, anthropometric measurements weight and height were collected using the standard procedures from the sample. Body Mass Index (BMI) was calculated according to the formula (weight (kg) /height² (mt)) (23). According to World Health Organization (WHO), 2004, (24) weight status was classified into four categories: underweight (BMI \leq 18.5), normal weight (BMI between 18.5 – 24.9), overweight (BMI between 25–29.9), and obese (BMI \geq 30).

Statistical analysis: The data collected was coded and entered. The raw data was cleaned and edited for inconsistencies. The data was statistically analyzed by using Statistical Package for Social Sciences (version 18.0, SPSS, Inc) software. The results were presented as frequencies and percentage for qualitative data. Means and standard deviations were calculated for the continuous variables. By Crosstabs, the Chi-Square test and Odds Ratio with 95% confidence interval were applied to examine the differences in KAP among the nutrition and non-nutrition students. The P values less than 0.05 or <0.01 and <0.000 were considered significant and highly significant, respectively.

RESULTS

The mean age of the study population with \pm SD was 20.96 ± 1.686 years (range 18-27) and the mean BMI \pm SD was 22.88 ± 4.23 (Table No 1). Figure 1 presents the distribution of BMI groups in the study population, suggesting that about 62% of the population were normal weight, 12 % were underweight, 20 % were overweight, and 6 % were obese.

Table 1. Demographic and Anthropometric Profile of the Study Population

| Variables | Min | Max | Mean | Std. Dev. |
|--------------------------|------|------|--------|-----------|
| Age (years) | 18 | 27 | 20.96 | 1.686 |
| Height (cm) | 140 | 177 | 159.46 | 5.626 |
| Weight (kg) | 32 | 110 | 58.23 | 11.203 |
| BMI (kg/m ²) | 13.7 | 46.4 | 22.888 | 4.2300 |

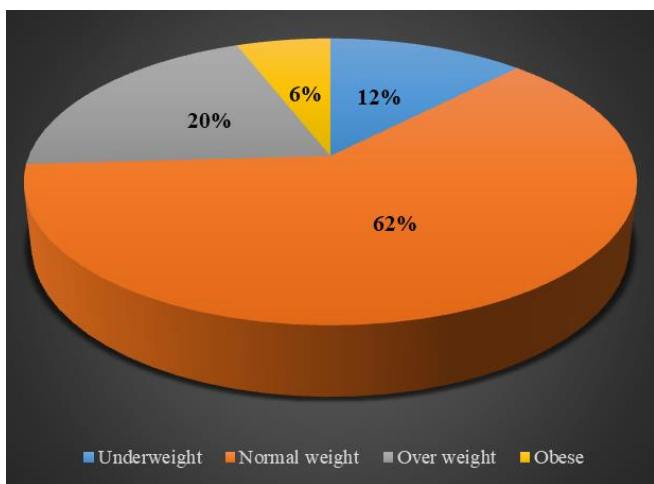


Figure 1: Prevalence of BMI groups in the study population

Figure 2 represents the general nutrition knowledge, which the study population self-perceived. 14.8% of the population perceived that they have a very good knowledge on nutrition, about 66.7% of the population has an average or good knowledge, whereas 18.5% of the population has a poor knowledge of nutrition.

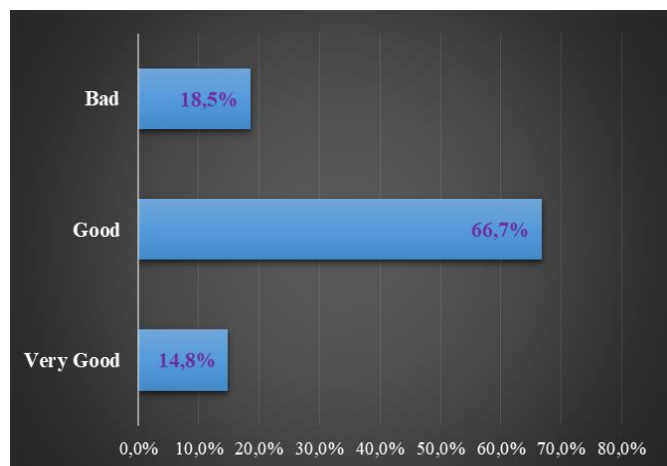
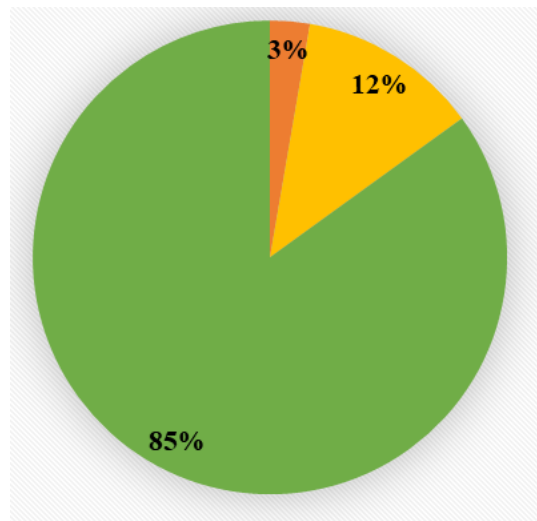


Figure 2: Self-Perceived Nutrition Knowledge among the study population



■ In Family ■ Among Relatives ■ None

Figure 3: History of Breast Cancer among the study population

Table 2 represents the correlation between science and non-science students towards the nutrition knowledge of BC prevention. There was little difference in nutrition knowledge between the science and non-science students. However, when the percentage is considered on the nutrition knowledge among the study samples, it was more prominent that science students have a good knowledge of all aspects of BC prevention. On the other hand, the correlation was not statistically significant with all the parameters except for the knowledge on soy products that reduce the risk of BC, which was statistically significant ($P < 0.05$), resulting in twice better knowledge among science students compared with the non-science students.

It is clear from **Figure 4** that almost 90% of the study population has knowledge that BC is preventable. Likewise, 73% of the samples know that eating healthy foods can prevent BC. But the knowledge of the risk of obesity and consumption of fast foods shows almost equal distribution the study population.

Table 3 represents the correlation between science and non-science students towards attitude of BC prevention. There was not much difference in the attitude towards BC prevention between the science and non-science students. However, as said before when the percentage is consider on the attitude among the study samples, it was clear that science students have a better attitude when compare to non-science students. The attitude towards consuming eggs prevent BC was statistically significant ($P < 0.05$), showing disagreement by science students, which is twice higher as the non-science students.

Table 4 represents the correlation between science and non-science students towards the practice of BC prevention. The results were statistically significant ($P < 0/05$) for the practice of exercise, consuming fruits and vegetables, and drinking green tea showing a higher number among science students than non-science students. The other variables on practice to prevent breast cancer, like consumption of whole grains, dietary fiber, olive oil, and fish, also show a better rise in number among science students than the non-science students.

Table 2: Correlation between Science and Non-Science Students towards Knowledge of BC Prevention

| Variables | | | Course of study | | Total | Pearson Chi-Square | Odds Ratio (95% CI) |
|---|-----|------------------------------|-----------------|-------------|--------|--------------------|------------------------|
| | | | Science | Non-Science | | | |
| Is BC preventable | Yes | Count | 229 | 134 | 363 | 0.567 | 1.282 (0.671-2.448) |
| | | % within BC preventable | 63.1% | 36.9% | 100.0% | | |
| | No | Count | 24 | 18 | 42 | | |
| | | % within BC preventable | 57.1% | 42.9% | 100.0% | | |
| Eating healthy foods can prevent BC | Yes | Count | 185 | 111 | 296 | 0.000 | 1.005 (0.639-1.581) |
| | | % within healthy foods | 62.5% | 37.5% | 100.0% | | |
| | No | Count | 68 | 41 | 109 | | |
| | | % within healthy foods | 62.4% | 37.6% | 100.0% | | |
| Effect of nutrition on the risk of developing BC | Yes | Count | 173 | 100 | 273 | 0.290 | 1.125 (0.734-1.724) |
| | | % within effect of nutrition | 63.4% | 36.6% | 100.0% | | |
| | No | Count | 80 | 52 | 132 | | |
| | | % within effect of nutrition | 60.6% | 39.4% | 100.0% | | |
| Smoking and drinking contributes BC | Yes | Count | 178 | 98 | 276 | 1.513 | 1.308 (0.852-2.006) |
| | | % within smoking | 64.5% | 35.5% | 100.0% | | |
| | No | Count | 75 | 54 | 129 | | |
| | | % within smoking | 58.1% | 41.9% | 100.0% | | |
| Fruits and vegetables prevent BC | Yes | Count | 128 | 84 | 212 | 0.830 | 0.829 (0.554-1.241) |
| | | % within fruits & vegetable | 60.4% | 39.6% | 100.0% | | |
| | No | Count | 125 | 68 | 193 | | |
| | | % within fruits & vegetable | 64.8% | 35.2% | 100.0% | | |
| Whole grains and fibre prevent BC | Yes | Count | 116 | 69 | 185 | 0.008 | 1.019 (0.680-1.525) |
| | | % within whole grain | 62.7% | 37.3% | 100.0% | | |
| | No | Count | 137 | 83 | 220 | | |
| | | % within whole grain | 62.3% | 37.7% | 100.0% | | |
| Obesity risk factor of BC | Yes | Count | 106 | 65 | 171 | 0.029 | 0.965 (0.642-1.450) |
| | | % within obesity | 62.0% | 38.0% | 100.0% | | |
| | No | Count | 147 | 87 | 234 | | |
| | | % within obesity | 62.8% | 37.2% | 100.0% | | |
| Oral contraceptives and HRT link to BC | Yes | Count | 75 | 47 | 122 | 0.074 | 0.941 (0.608-1.457) |
| | | % within contraceptives | 61.5% | 38.5% | 100.0% | | |
| | No | Count | 178 | 105 | 283 | | |
| | | % within contraceptives | 62.9% | 37.1% | 100.0% | | |
| Environmental risk factors | Yes | Count | 147 | 81 | 228 | 0.894 | 1.216 (0.811-1.822) |
| | | % within environment | 64.5% | 35.5% | 100.0% | | |
| | No | Count | 106 | 71 | 177 | | |
| | | % within environment | 59.9% | 40.1% | 100.0% | | |
| Soy reduces risk of BC | Yes | Count | 104 | 49 | 153 | 3.178* | 1.467 (0.962-2.238) |
| | | % within soy | 68.0% | 32.0% | 100.0% | | |
| | No | Count | 149 | 103 | 252 | | |
| | | % within soy | 59.1% | 40.9% | 100.0% | | |
| Fast food consumption increases the risk of BC | Yes | Count | 142 | 83 | 225 | 0.089 | 1.063 (0.710-1.594) |
| | | % within fast food | 63.1% | 36.9% | 100.0% | | |
| | No | Count | 111 | 69 | 180 | | |
| | | % within fast food | 61.7% | 38.3% | 100.0% | | |
| Breast feeding reduces the risk of BC | Yes | Count | 187 | 111 | 298 | 0.038 | 1.047 (0.664-1.650) |
| | | % within breast feeding | 62.8% | 37.2% | 100.0% | | |
| | No | Count | 66 | 41 | 107 | | |
| | | % within breast feeding | 61.7% | 38.3% | 100.0% | | |

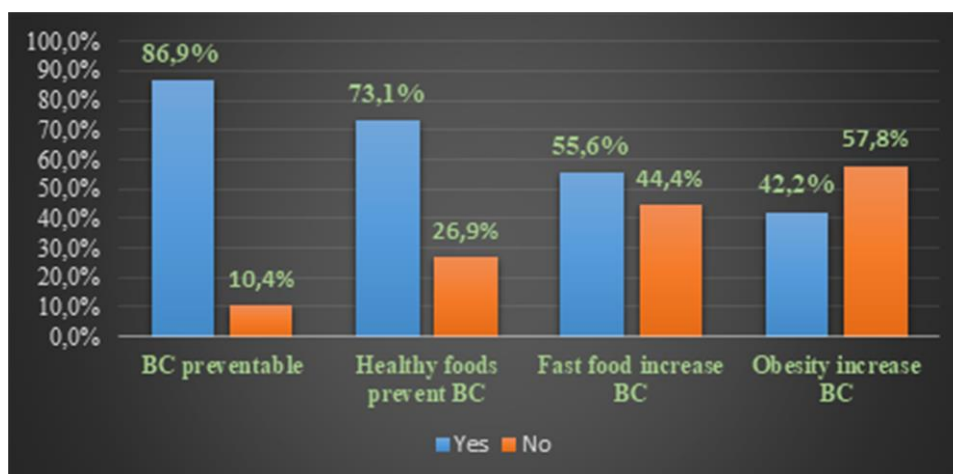


Figure 4: Knowledge of BC Prevention among the study population

Table 3: Correlation between Science and Non-Science Students towards Attitudes of BC Prevention

| Variables | | | Course of study | | Total | Pearson Chi-Square | Odds Ratio (95% CI) |
|---|-----|---------------------------|-----------------|-------------|--------|--------------------|------------------------|
| | | | Science | Non-Science | | | |
| Does hydrogenated oils cause Breast Cancer ? | Yes | Count | 120 | 68 | 188 | 0.277 | 1.115 (0.744-1.669) |
| | | % within hydrogenated oil | 63.8% | 36.2% | 100.0% | | |
| | No | Count | 133 | 84 | 217 | 1.152 | 1.317 (0.796-20181) |
| | | % within hydrogenated oil | 61.3% | 38.7% | 100.0% | | |
| Does grilled red meat cause Breast Cancer ? | Yes | Count | 58 | 28 | 86 | 0.773 | 0.828 (0.544-1.261) |
| | | % within grilled meat | 67.4% | 32.6% | 100.0% | | |
| | No | Count | 195 | 124 | 319 | 0.369 | 0.868 (0.551-1.370) |
| | | % within grilled meat | 61.1% | 38.9% | 100.0% | | |
| Does garlic prevent Breast Cancer | Yes | Count | 84 | 57 | 141 | 2.776* | 0.642 (0.381-1.084) |
| | | % within garlic | 59.6% | 40.4% | 100.0% | | |
| | No | Count | 169 | 95 | 264 | 0.161 | 1.103 (0.684-1.778) |
| | | % within garlic | 64.0% | 36.0% | 100.0% | | |
| Does turmeric prevent Breast Cancer | Yes | Count | 63 | 42 | 105 | 0.070 | 0.941 (0.6.2-1.473) |
| | | % within turmeric | 60.0% | 40.0% | 100.0% | | |
| | No | Count | 190 | 110 | 300 | 0.002 | 1.009 (0.679-1.516) |
| | | % within turmeric | 63.3% | 36.7% | 100.0% | | |
| Does eggs prevent Breast Cancer | Yes | Count | 37 | 32 | 69 | 2.576* | 1.391 (0.929-2.083) |
| | | % within eggs | 53.6% | 46.4% | 100.0% | | |
| | No | Count | 216 | 120 | 336 | 0.002 | 1.009 (0.679-1.516) |
| | | % within eggs | 64.3% | 35.7% | 100.0% | | |
| Does Vitamin D deficiency causes Breast Cancer | Yes | Count | 61 | 34 | 95 | 0.070 | 0.941 (0.6.2-1.473) |
| | | % within vitamin D | 64.2% | 35.8% | 100.0% | | |
| | No | Count | 192 | 118 | 310 | 0.002 | 1.009 (0.679-1.516) |
| | | % within Vitamin D | 61.9% | 38.1% | 100.0% | | |

Table 4: Correlation between Science and Non-Science Students towards Practice of BC Prevention

| Variables | | | Course of study | | Total | Pearson Chi-Square | Odds Ratio (95% CI) |
|---|-----|-----------------------------|-----------------|-------------|--------|--------------------|------------------------|
| | | | Science | Non-Science | | | |
| Do you exercise daily to prevent Breast Cancer? | Yes | Count | 77 | 58 | 135 | 2.549* | 0.709 (0.465-1.082) |
| | | % within exercise | 57.0% | 43.0% | 100.0% | | |
| | No | Count | 176 | 94 | 270 | 4.200* | 0.656 (0.437-0.983) |
| | | % within exercise | 65.2% | 34.8% | 100.0% | | |
| Do you eat adequate amount of fruits and vegetables daily. | Yes | Count | 105 | 79 | 184 | 1.679 | 1.306 (0.872-1.955) |
| | | % within fruits & vegetable | 57.1% | 42.9% | 100.0% | | |
| | No | Count | 148 | 73 | 221 | 0.070 | 0.941 (0.6.2-1.473) |
| | | % within fruits & vegetable | 67.0% | 33.0% | 100.0% | | |
| Do you include adequate whole grains and dietary fibre in your diet? | Yes | Count | 130 | 68 | 198 | 0.002 | 1.009 (0.679-1.516) |
| | | % within dietary fibre | 65.7% | 34.3% | 100.0% | | |
| | No | Count | 123 | 84 | 207 | 2.576* | 1.391 (0.929-2.083) |
| | | % within dietary fibre | 59.4% | 40.6% | 100.0% | | |
| Do you use olive oil? | Yes | Count | 180 | 110 | 290 | 0.070 | 0.941 (0.6.2-1.473) |
| | | % within olive oil | 62.1% | 37.9% | 100.0% | | |
| | No | Count | 73 | 42 | 115 | 0.002 | 1.009 (0.679-1.516) |
| | | % within olive oil | 63.5% | 36.5% | 100.0% | | |
| Do you eat fish | Yes | Count | 147 | 88 | 235 | 0.002 | 1.009 (0.679-1.516) |
| | | % within fish | 62.6% | 37.4% | 100.0% | | |
| | No | Count | 106 | 64 | 170 | 2.576* | 1.391 (0.929-2.083) |
| | | % within fish | 62.4% | 37.6% | 100.0% | | |
| Do you take green tea | Yes | Count | 139 | 71 | 210 | 2.576* | 1.391 (0.929-2.083) |
| | | % within green tea | 66.2% | 33.8% | 100.0% | | |
| | No | Count | 114 | 81 | 195 | 0.002 | 1.009 (0.679-1.516) |
| | | % within green tea | 58.5% | 41.5% | 100.0% | | |

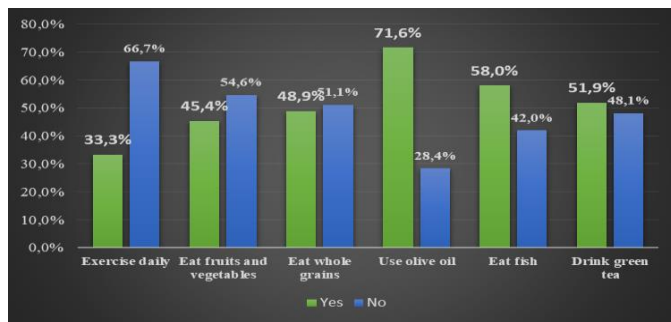
Figure 5: Practice of BC Prevention among the study population

Figure 5 states that only 33.3% of the participants engaged in daily exercise. 45.4% of the study population practice daily consumption of fruits and vegetables. Usage of olive oil was high among the participants to, about 71.6%. Practice of eating fish and drinking green tea was good among the participants to about 58% and 51.9%, respectively.

DISCUSSION

This survey investigated KAP towards the role of nutrition in BC prevention among female university students at University of Hail, Hail, and Saudi Arabia. In the present study, 90% of participants mentioned that BC could be prevented. 73% of students cited that eating healthy foods can prevent BC. Over 55% of participants didn't know the risk of consuming fast foods also, almost half of the study population does not know the effects of obesity on BC prevention. More than half of the students chose "unhealthy diet, weight gain, drinking alcohol, use of oral contraceptive pills and vitamin D deficiency" as BC risk factors and cited "consuming adequate vegetables, fruits, fish and olive oil" as dietary factors that can reduce the BC incidence. Several studies have evaluated knowledge of diet-cancer relationships among the different population (25, 26). The previous study (27) reported that the percentages of women citing dietary factors as a step for BC prevention were 20% in 1991 and 23% in 1995. The findings observed in this study mirror those of the previous studies that have found a variety of nutrition knowledge by age (28, 29), level of education (30) and employment status. Family history of BC may change one's mind about healthy eating and food preferences (31). We found that the students with a family history of BC had more nutrition knowledge about BC prevention. Our result indicated that the nutrition attitudes toward BC on different parameters like consumption of hydrogenated oil, grilled meat, garlic turmeric, eggs, and vitamin D deficiency seem to be very low among the study population. The World Cancer Research Fund (32) encourages everyone to choose a healthy lifestyle to prevent cancer, which includes being in the normal range of body weight, having a variety of vegetables and fruits, limiting consumption of red meats and avoiding consuming sugary food. In our study, only 33.3% of participants exercise daily as a practice on BC prevention. About 45.4% and 48.9% of participants reported consuming fruits and vegetables and whole grains per day, respectively; similar to the previous study (33). These results may also explain that increased stress levels would strongly be associated with reduced intakes of fruits and vegetable among students (34). Concerning the consumption of seafood as a beneficial source for cancer prevention, 58% of participants consumed fish for

less than once a week. Consumption of olive oil was high to almost 72% of the participants, and green tea was 52% consumed among the participants. This is in par with the study conducted in Iran University (35) which predicts that 76% of the participants mentioned that BC is preventable and nutrition-related attitudes and practices were positively correlated with BC prevention.

Our finding was in line with the idea of the previous study that, positive attitudes toward eating healthy were related to a better dietary profile (36). In support of our study, previous studies have found that knowledge can't be considered as only determinant of dietary behavior (37). Interpersonal/cultural effects, lack of access to healthy foods, and food preferences were the most important barriers to healthy nutrition among Saudi women (38). This is the first study reporting on the nutrition-related knowledge, attitudes, and practices regarding breast cancer prevention among female university students in Hail. These findings are limited by using a cross-sectional design and due to the differences in environmental status and aspects of the university as well as different characteristics of the students. Further studies need to be conducted in other locations of Saudi Arabia and with other demographic groups.

CONCLUSION

Globally, today's emerging health problems are difficult to manage with one discipline alone. In conclusion, nutrition KAP towards BC prevention were found to be influenced by factors such as age, the field of study, job, residency status and familial history of BC. These results provide further support for the hypothesis that having proper nutritional knowledge improves individuals' eating practices, which can reduce the risk of nutrition-related cancers such as breast cancer. These findings should be taken into account when designing breast health education programs. Finally, college students, who represent the future health status of the nation, must understand the importance of nutrition in relation to their health.

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Author Contributions: SBS, MSA, AA; designed of the study, data collection and analysis. SBS; submission of the manuscript and revisions

Ethical approval: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and/or with the Helsinki Declaration of 1964 and later versions. Informed consent or substitute for it was obtained from all patients for being included in the study.

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