Cognizance and utilization about breast cancer screening among the health professional female students and staffs of University Kuala Lumpur, Royal College of Medicine Perak, Malaysia

A. T. M. Emdadul Haque, Muhammad Afif Bin Mohd Hisham¹, Noor Azwa Laili Binti Ahmad Adzman¹, Nur Atiqah Binti Azudin¹, Nursakinah Binti Shafri¹, Mainul Haque²

Department of Medical Education, Faculty of Medicine, Universiti Kuala Lumpur-Royal College of Medicine Perak (UniKL RCMP), ¹Year-3 MBBS Student, UniKL RCMP, Ipoh, ²Unit of Pharmacology, Faculty of Medicine and Defense Health, National Defense University of Malaysia, Kem Sungai Besi, 57000 Kuala Lumpur, Malaysia

Address for correspondence:

Dr. A. T. M. Emdadul Haque, Department of Medical Education, Faculty of Medicine, Universiti Kuala Lumpur-Royal College of Medicine Perak (UniKL RCMP), No. 3, Jalan Greentown, 30450 Ipoh, Malaysia. E-mail: emdadul@unikl.edu.my

INTRODUCTION

Breast cancer (BC) is a major life-threatening global concern including Malaysia.^[1-5] Increase incidence of BC is observed both in developed and developing countries.^[6-10] Globally, BC is also the most common cause of cancer death, the most frequently diagnosed cancer, and now represents one in four of all cancers in women.^[11] The incidence rates of BC in the developing countries are escalating because of increasing life expectancy, growing urbanization, particularly in younger women, and greater adoption of Western lifestyles.^[12-15] Another study reported that "the increasing toll of BC in developing nations is really a devastating situation."^[16] The emergence of BC and subsequent complications of cancer tend to be more

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ABSTRACT

Background: Breast cancer (BC) is a major life-threatening problem and a global concern including Malaysia. BC is an equal threat for both developing and developed countries. The aim of this study was to determine the relationship between sociodemographic factors with knowledge, attitude, and perception on BC screening among the females of University Kuala Lumpur, Royal College of Medicine Perak (UniKL RCMP). Materials and Methods: This cross-sectional study was conducted from 2015 to 2016. The populations included were the students and staff of UniKL RCMP. The simple sampling method was used and a set of questionnaire was prepared and distributed to the participants who were willing to participate. The data were analyzed by using the SPSS version 17. Results: Of the 220 only 203 questionnaires were returned. Nearly 87.7% of participants indicated genetic factors as the cause of BC, followed by exposure to carcinogenic and X-ray. Excessive smoking (54.2%) and sedentary lifestyle (52.2%) were the risk factors of the BC. 100% of participants thought that breast self-examination (BSE) is important to detect a breast lump and most of them (76.8%) knew what a mammogram is but only 2.0% went for a mammogram. Chemotherapy (71.9%) and surgery (71.9%) were treatments options according to study participants. Nearly 91.1% agreed that regular mammogram could help to detect BC at an early stage. Nearly 88.2% thought BC is not easily curable. Finally, for the attitude on BC screening, most of them knew how to perform BSE (69.0%) with the frequency of 36.0% doing it once a year. Conclusions: The majority of the participants found the good knowledge on BC and on how to perform BSE. Although most of them knew what a mammogram is, only a few have gone for it since perhaps it is recommended for those who are above 50-year-old. Therefore, researchers believe and trust that there is an urgent need of state-funded multicenter study to prevent and early diagnosis of BC in Malaysia.

Key words: Awareness, breast cancer screening, females, Malaysia, practice, "University Kuala Lumpur, Royal College of Medicine Perak"

> aggressive in young women compared to older population mainly due to lack of awareness and resulting in lower survival rates.^[17-21] Therefore, early detection, accurate diagnosis, and self-awareness of BC are more crucial among young female for the treatment outcome.^[20-22] The WHO stated, 7% of BC cases in Malaysia occur in women under the age of 35, 14% occur in women under 40%, and 28% in women under the age of 45. Forty-eight percent of the cases occur in women under the age of 50.^[23] The majority of Malaysian does not go for screenings and perform

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MATERIALS AND METHODS

This was a cross-sectional, descriptive study to identify the level of awareness and practice about BC screening among the students and staff of UniKL RCMP, Malaysia. It was conducted on both the Campuses of UniKL RCMP, and the study period was from October 2015 to January 2016. All the female students and staff who agreed to participate and were available during the study period were included. Of the 800 students and staff, approximately 200 females were calculated as the sample size using the Epi Info 6.04d (January 2001, Centers for Disease Control and Prevention) application with the prevalence to the previous study. Targeted samples were informed about the study, and the consent was taken through the informed consent form. Study participants were distributed a questionnaire which was prepared and validated by an expert panel. Ethical approval was also obtained from the Ethics Committee of UniKL RCMP, Malaysia. Participants' responses and information were kept strictly confidential, and the raw data were then collected and entered into the Microsoft Excel and was analyzed by using the SPSS version 21.0 (IBM Corporation, Armonk, NY).

RESULTS

Sociodemographic characteristics

A total of 203 participated in this study. The participants' age range was 19-60 years, consisting of medical and pharmacy students and staff. Age was grouped as 19-20, 21-22, 23-24, and above 25, and their responses were 61.1% (124), 17.2%(35), 7.9% (16), and 13.8% (28), respectively. Nearly 43.8% (89) had known about BC screening, but the majority (56.2% [114]) respondents did not have any knowledge of BC screening. Eighty-nine respondents had previous knowledge on BC because their relatives (19.2% [39]), friends (10.8% [22]), neighbor (8.9% [18]), and family members (8.4% [17]) suffered from it. The educational background of the respondents was 71.9% (146) medical students, 13.3% (27) pharmacy students, 6.4% (13) diploma, 3% (6) masters, 2.5% (5) SPM, 2% (4) bachelors, and 1% (2) PhD, respectively. Almost all participants were Muslims 92.6% (188) and the rest were Hindus 3% (6), Christians 2.5% (5), Buddhists 1% (2), and others 1% (2). The ethnic distribution was 89.7%Malay, 4.5% (9) Indian, 1% (2) Chinese, and 4.9% (10) from other ethnic group, respectively. The marital status of the respondents was 85.7% (174) single and 14.3% (29) married, but none was widowed or divorced.

Knowledge of breast cancer

Twenty-three percent (47), 21% (43), 19% (39), 18% (36), 13% (26), and 6% (12) of the study respondents cited

as a source of information about BC from the internet; pamphlets, book and etc.; television either documentaries or advertise; academic classes; relatives, friends, and lecturers; and radio, respectively. Nearly 34%, 27%, 13%, 12%, 10%, and 4% study respondents thought that genetic factors, exposure to carcinogens, exposure to X-rays, prolonged or early use of oral contraceptives, estrogen replacement therapy, and overweight, especially after menopause were the cause of BC. Nearly 54.18% (110), 52.21% (106), 42.36% (86), 42.36% (86), 40.39% (82), 27.09% (55), and 5.91% (12) of study respondents opined that excessive smoking, sedentary lifestyle, high junk food consumption, stress, excessive alcohol consumption, high animal fat diet, and prolonged use hair dyes, respectively, were the risk factors of BC. Respondents often reported multiple causes. Other than the risk factors mentioned, the race also was related to the occurrence of BC. White women were more likely to get BC compared to nonwhites. Other than that reduced levels of melatonin, which is related to sleeping patterns, are related to BC. About 100% of the participants believed that BSE is important to detect a breast lump in an early stage and can help to reduce morbidity and mortality. The majority (76.8% [156]) of study respondents knew about mammogram and its strength to detect BC. Thirty-five percent (71), 34% (69), 16% (33), 10% (20), and 5% (10) knew about the treatment options such as chemotherapy, surgery, radiotherapy, spiritually, and traditionally, respectively. Some respondents also know chemotherapy for BC is actually a combination of drugs that can be given by mouth and parenterally, chemotherapy shrinks the tumor prior to surgery, decrease the chances of recurrence following surgery, and to prevent metastasis. Nearly 84.73% (172), 52.71% (107), 51.23% (104), 36.95% (75), and 13.30% (27) of the study respondents believed that BC can be prevented by with regular BSE, control diet, regular exercise, breastfeeding, and vaccination, respectively. At many occasions, responders opted multiple options.

The correlation between sociodemographics and total knowledge scores

Age group and total knowledge scores

The was statistically (P = 0.03) significant correlation observed between four age groups 19–20, 21–22, 23–24, and 25–60 and total knowledge scores (TKS) [Table 1].

Background history of breast cancer and total knowledge scores

There were statistically no significant (P > 0.05) observation concluded between the background history of BC and TKS with the exception in family members possess statistically significant (P = 0.005) differences [Table 2].

Educational qualifications and total knowledge scores

In addition, there was also statistically no significant (P = 0.055) correlation observed between educational

Table 1: Correlation between age and totalknowledge scores stated by the studyparticipants							
Age (years		TKS (%)		χ²	Р		
old)	Low	Average	High				
19-20	58 (46.8)	14 (11.3)	52 (41.9)	78.680	0.03		
21-22	9 (25.7)	4 (11.4)	22 (62.9)				
23-24	4 (25)	o (o)	12 (75)				
25-60	19 (67.9)	1(3.6)	8 (28.6)				

TKS – Total knowledge scores

qualification and TKS [Table 3]. Furthermore, there was also statistically no significant (P = 0.055) correlation observed between Religion and TKS (P = 0.727), Ethnicity and TKS (P = 0.117). Nevertheless, there was also statistically significant (P = 0.005) correlation observed between marital status and TKS [Table 4].

Perception on breast cancer, breast self-examination, and mammogram

The majority of participants (77.3%) thought that mammogram screening is useful to keep updated on their health status. Approximately, 30% indicate that they preferred the examination to be done by a female physician and 15.8% thought the mammogram procedure is painful. Even though there were some respondents (3.0%) did not bother having a BC screening, almost all (91.1%) considered mammogram as a useful method to help detect any signs of BC at an early stage. The majority of respondents (71.9%) considered BC will cause them worried, but nearly half (52.7%) also gets depressed if they were to be diagnosed as such. About 51.7% have a thought that they have to continue life without giving up, and some of them (12.8%) felt embarrassed to tell their relatives and friends about the serious disease they are having. Most of the participants had a perception that BC cannot be cured easily.

The correlation between sociodemographic and perception of breast cancer

The result of the study showed a relation between the sociodemographic factor and perceptions of BC, BSE, and mammogram [Table 5]. There was no statistically significant correlation found between age groups (P = 0.0760), educational qualifications (P = 0.774), religion (P = 0.948), ethnicity (P = 0.532), and marital status (P = 0.523) and perception about BC. By the same token, there was no statistically significant correlation between background history - family members (P = 0.499), relatives (P = 0.192), friends (P = 0.814), neighbor (P = 0.269), and perception of BC among the study participants.

Practice on breast self-examination and mammogram

In the same way, there was no statistically significant (P > 0.05) correlation found between any of the

participants								
Background	ground TKS (%)						χ²	Р
		Yes			No			
	Low	Average	High	Low	Average	High		
Family member	5 (29.4)	3 (17.6)	9 (53)	85 (45.7)	16 (8.6)	85 (45.7)	34.301	0.005
Relative	14 (35.9)	5 (12.8)	20 (51.3)	76 (46.3)	14 (8.5)	74 (45.1)	11.183	0.798
Friend	11 (50)	o (0.0)	11 (50)	79 (43.9)	19 (10.6)	82 (45.6)	15.243	0.507
Neighbor	9 (50)	3 (16.7)	6 (33.3)	81 (43.8)	16 (8.6)	88 (47.6)	11.949	0.747

Table 2: Correlation between background history and total knowledge scores stated by the study participants

TKS – Total knowledge scores

Table 3: Correlation between educationalqualification and total knowledge scores statedby the study participants

Educational		TKS (%)	χ²	Р	
qualifications	Low	Average	High		
SPM	4 (80)	0	1 (20)	119.116	0.055
Diploma	9 (69.2)	1(7.7)	3 (23.1)		
Bachelor	2 (50)	0	2 (50)		
Master	5 (83.3)	0	1 (16.7)		
PhD	2 (100)	0	0		
Medical students	56 (38.4)	15 (10.3)	75 (51.4)		
Pharmacy students	12 (44.4)	3 (11.1)	12 (44.4)		
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TKS – Total knowledge scores

Table 4: Correlation between marital statusand total knowledge scores stated by thestudy participants

Marital status		TKS (%)		χ²	Р
	Low	Average	High		
Single	71 (40.8)	18 (10.3)	85 (48.9)	34.041	0.005
Married	19 (65.5)	1(3.4)	9 (31)		
	1				

TKS – Total knowledge scores

sociodemographic and practice of BSE and mammogram. Correspondingly, there was no statistically significant (P > 0.05) correlation found between background history and practice on BSE and mammogram among the study participants.

DISCUSSION

The current study found that there were 43.8% of participants who had a family history of BC. The top risk factors chosen by participants were excessive smoking, sedentary lifestyle, high junk food consumption, stress, high alcohol consumption, high animal fat diet, and prolonged use of dark hair dye. The majority participants were aware of genetic linkage of BC. A very small group of participants were not aware that overweight and postmenopausal age may be causes of BC. Early discovery of breast lumps through BSE is important for prevention and early detection of this disease. BSE is an easy screening method which cost nothing and absolutely privacy maintained.^[10,20,21,49] In the previous studies, most of the

women did not have sufficient knowledge of BSE.^[10,20,21,49] Our study found out that most of the participants knew that BSE is important for early detection of a breast lump. Although the majority study participants know how to perform BSE, but just over one-sixth to one-third of them does BSE 1–3 times per year.

Furthermore, most women had a lack of awareness to go for mammography with the exception of an educated community.^[10,20,21,49] Although the majority of the study of participants knew about mammogram and its utility to detect BC very early and maintain their health but did not do because they have not passed on tertiary care hospital as they were mainly belonging 20-24 ages. A small group has a misconception regarding mammogram is painful, and almost one-third demanded the test should be conducted by female doctors. This can be explained as the study population was not much aware of the procedure, mainly Muslims have a conservative attitude. The majority participants were aware of BC treatment options like surgery and chemotherapy; these findings were similar to a number studies.^[10,20,21,49] The greater part of participants thought that BC was not easily cured, but a minor portion thought that it was easily cured. The study participants also described that they will feel depressed, life must go on, and embarrassed if diagnosed as BC. Television and newspapers were cited as the most important sources of information regarding BC.[10,20,21,49] In our study, the internet was the most preferable source and the least choice was a radio. Women with a high awareness of BC opted for breast examination biannually by the physician and those with poor awareness did not think that breast examination is the screening approach.[10,20,21,49] The participants, by and large, thought that performing BSE is the preventive method for BC. They also gave their opinions on increasing publicity through mass media and campaign. The participants were being asked whether they are interested to attend BC awareness campaign and most of them agreed.

Limitation of study

The difficulties of coping with the timetable of the clinical year students since they were having bedside teaching in

Table 5: Correlation between sociodemographicand perception of breast cancer stated by thestudy participants

Sociodemographic data	n (%)			χ²	Р
	Low	Average	High		
Age					
19-20	33 (26.6)	33 (26.6)	58 (46.8)	18.845	0.760
21-22	10 (28.6)	8 (22.9)	17 (48.5)		
23-24	4 (25.0)	4 (25.0)	8 (50.0)		
25-60	14 (50.0)	7 (25.0)	7 (25.0)		
Educational qualification					
SPM	3 (60.0)	1 (20.0)	1(20.0)	40.388	0.774
Diploma	5 (38.5)	5 (38.5)	3 (23.0)		
Bachelor	2 (50.0)	1(25.0)	1 (25.0)		
Master	5 (83.3)	0	1 (16.7)		
PhD	2 (100.0)	0	0		
Medical students	36 (24.7)	36 (24.7)	74 (50.6)		
Pharmacy students	8 (29.6)	9 (33.3)	10 (37.1)		
Religion					
Islam	56 (29.8)	47 (25.0)	85 (45.2)	20.196	0.948
Hinduism	2 (33.30)	2 (33.30)	2 (33.3)		
Buddhism	1 (50.0)	1 (50.0)	0		
Christians	2 (40.0)	1 (20.0)	2 (40.0)		
Others	0	1 (50.0)	1(50.0)		
Ethnicity					
Malay	54 (29.7)	47 (25.8)	81 (44.5)	30.715	0.532
Chinese	1 (50.0)	1 (50.0)	0		
Indian	3 (33.3)	2 (22.2)	4 (44.4)		
Others	3 (30.0)	2 (20.0)	5 (50.0)		
Marital status					
Single	47 (27.0)	45 (25.9)	82 (47.1)	7.124	0.523
Married	14 (48.3)	7 (24.1)	8 (27.6)		

the hospital. Therefore, certain participants did not answer the questionnaire as expected and caused an interruption in our study.

CONCLUSIONS

The majority of study participants had good knowledge of BC and usually perform BSE. Only a few of them went for mammography because it is recommended only who are above 50 years, but most of the study participants were much younger. Participants were aware of causes, risk factors, treatments, and preventive methods, even though they have no family history of BC. Most of them were interested to join awareness campaign. Knowledge of the participants was adequate, but the level of practice was low. Therefore, a wider multicenter study is advocated to prevent and early diagnosis of BC.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Ameer K, Abdulie SM, Pal SK, Arebo K, Kassa GG. Breast cancer awareness and practice of breast self-examination among female medical students in Haramaya University, Harar, Ethiopia. IJIMS 2014;2:109-19.
- Elgaffar SI, El-Fatah Atia GA. The Impact of implementing educational program regarding breast self-examination on knowledge and practices of female students of Nursing technical institute of Menoufia University. J Nurs Sci 2015;1:44-50.
- Gopal RR, Oranye NO, Ho SE, Zuraida J, Zakaria SZ. Complementary and alternative medicine use among breast cancer patients in a tertiary hospital in Malaysia. Malays J Public Health Med 2013;13:11-9.
- Pathy NB, Yip CH, Taib NA, Hartman M, Saxena N, Iau P, et al. Breast cancer in a multi-ethnic Asian setting: Results from the Singapore-Malaysia hospital-based breast cancer registry. Breast 2011;20 Suppl 2:S75-80.
- Shaharudin SH, Sulaiman S, Emran NA, Shahril MR, Hussain SN. The use of complementary and alternative medicine among Malay breast cancer survivors. Altern Ther Health Med 2011;17:50-6.
- World Health Organization (WHO). Global Status Report on Noncommunicable Diseases 2010; Geneva, Switzerland; 2011. Available from: http://www.who.int/nmh/publications/ ncd report full en.pdf. [Last accessed on 2016 Mar 19].
- Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A. Global cancer statistics, 2012. CA Cancer J Clin 2015;65:87-108.
- Tfayli A, Temraz S, Abou Mrad R, Shamseddine A. Breast cancer in low- and middle-income countries: An emerging and challenging epidemic. J Oncol 2010;2010:490631.
- DeSantis C, Siegel R, Jemal A. Breast Cancer Facts and Figures 2013-2014. American Cancer Society; 2013. p. 1-38. Available from: http://www.cancer.org/acs/groups/ content/@research/documents/document/acspc-042725. pdf. [Last accessed on 2016 Mar 19].
- Tazhibi M, Feizi A. Awareness levels about breast cancer risk factors, early warning signs, and screening and therapeutic approaches among Iranian adult women: A large population based study using latent class analysis. Biomed Res Int 2014;2014:306352.
- International Agency for Research on Cancer. Latest world cancer statistics Global cancer burden rises to 14.1 million new cases in 2012: Marked increase in breast cancers must be addressed. World Health Organization; 2013. Available from: https://www.iarc.fr/en/media-centre/pr/2013/pdfs/ pr223_E.pdf. [Last accessed on 2016 Mar 19].
- 12. Boutayeb A, Boutayeb S. The burden of non communicable diseases in developing countries. Int J Equity Health 2005;4:2.
- Habib SH, Saha S. Burden of non-communicable disease: Global overview. diabetes and metabolic syndrome. Clin Res Rev 2010;4:41-7.
- Boutayeb A. The double burden of communicable and non-communicable diseases in developing countries. Trans R Soc Trop Med Hyg 2006;100:191-9.
- 15. Smyth L, Hudis C. Adjuvant hormonal therapy in premenopausal women with breast cancer. Indian J Med Paediatr Oncol 2015;36:195-200.

- Singh S, Shrivastava JP, Dwivedi A. Breast cancer screening existence in India: A nonexisting reality. Indian J Med Paediatr Oncol 2015;36:207-9.
- Siegel K, Gluhoski V, Gorey E. Age-related distress among young women with breast cancer. J Psychosoc Oncol 1999;17:1-20.
- Renouf C, Henwood J, Henshall S. Not Just an Older Woman's Disease: Breast Cancer In Your 20s and 30s. National Breast Cancer Foundation; 2014. Available from: http://www. 800youngwomen.org.au/Content/pdf/NBCF_ YoungWomansReport_2014.pdf. [Last accessed on 2016 Mar 19].
- Anders CK, Johnson R, Litton J, Phillips M, Bleyer A. Breast cancer before age 40 years. Semin Oncol 2009;36:237-49.
- Boulos DN, Ghali RR. Awareness of breast cancer among female students at Ain Shams University, Egypt. Glob J Health Sci 2013;6:154-61.
- Ranasinghe HM, Ranasinghe N, Rodrigo C, Seneviratne Rde A, Rajapakse S. Awareness of breast cancer among adolescent girls in Colombo, Sri Lanka: A school based study. BMC Public Health 2013;13:1209.
- 22. Patnayak R, Jena A, Rukmangadha N, Chowhan AK, Sambasivaiah K, Phaneendra BV, *et al.* Hormone receptor status (estrogen receptor, progesterone receptor), human epidermal growth factor-2 and p53 in South Indian breast cancer patients: A tertiary care center experience. Indian J Med Paediatr Oncol 2015;36:117-22.
- Indramalar S. Breast cancer strikes younger women in developing countries. The Star Online; 2014. Available from: http://www.thestar.com.my/lifestyle/ family/features/2014/10/17/breast-cancer-strikesyounger-women-in-developing-countries/. [Last accessed on 2016 Mar 21].
- Ahmadian M, Samah AA. A literature reviews of factors influencing breast cancer screening in Asian countries. Life Sci J 2012;9:585-94.
- 25. Farid ND, Aziz NA, Al-Sadat N, Jamaludin M, Dahlui M. Clinical breast examination as the recommended breast cancer screening modality in a rural community in Malaysia; what are the factors that could enhance its uptake? PLoS One 2014;9:e106469.
- Hadi MA, Hassali MA, Shafie AA, Awaisu A. Evaluation of breast cancer awareness among female university students in Malaysia. Pharm Pract (Granada) 2010;8:29-34.
- Hirsch KR. The Healthline Editorial Team. What Do You Want to Know About Breast Cancer? Available from: http://www. healthline.com/health/breast-cancer. [Last accessed on 2016 Mar 21].
- RettnerR.BreastCancer:Symptoms,TreatmentandPrevention. Livescience. 2015. Available from: http://www.livescience. com/34706-breast-cancer-symptoms-treatment-prevention. html. [Last accessed on 2016 Mar 21].
- 29. Linsell L, Burgess CC, Ramirez AJ. Breast cancer awareness among older women. Br J Cancer 2008;99:1221-5.
- Grunfeld EA, Ramirez AJ, Hunter MS, Richards MA. Women's knowledge and beliefs regarding breast cancer. Br J Cancer 2002;86:1373-8.
- Ravi C, Rodrigues G. Accuracy of clinical examination of breast lumps in detecting malignancy: A retrospective study. Indian J Surg Oncol 2012;3:154-7.
- 32. Saadat S. Can we prevent breast cancer? Int J Health Sci 2010;2:167-70.
- 33. Wahid MI. Breast Cancer. Malaysian Oncological Society. Available from: http://www.malaysiaoncology.org/article. php?aid = 114. [Last accessed on 2016 Mar 21].
- Chumiran SH, Mukhtar NM, Mahat N. Breast Cancer Epidemiology: A Case Study. Institut Pengurusan Penyelidikan Universiti Teknologi Mara, Selangor, Malaysia; 2008. Available from: http://www.ir.uitm.edu.my/6728/1/

LP_SITI%20HUSNIAH%20CHUMIRAN%2008_24.PDF. [Last accessed on 2016 Mar 21].

- Macmillan Cancer Support. Causes and Risk Factors; 2016. Available from: http://www.macmillan.org.uk/ information-and-support/breast-cancer/diagnosing/ causes-and-risk-factors. [Last accessed on 2016 Mar 22].
- Mandal A. Breast Cancer Causes. News-Medical.net An AZoNetwork Site. Available from: http://www.news-medical. net/health/Breast-Cancer-Causes.aspx. [Last accessed on 2016 Mar 22].
- 37. Risk Factors and Causes of Breast Cancer; 2013. Available from: http://www.nhs.uk/ipgmedia/ National/Macmillan%20Cancer%20 Support/assets/ RiskfactorsandcausesofbreastcancerMCS4pages.pdf. [Last accessed on 2016 Mar 22].
- Jardines L, Haffty BG, Doroshow JH, Fisher P, Weitzel J, Theriault RL. Breast cancer overview. Risk factors, screening, genetic testing, and prevention. In: Pazdur R, Coia LR, Hoskins WJ, Wagman LD, editors., 14th ed. Norwalk: Cancer management - A multidisciplinary approach, Oncology Journal; 2012.
- U.S. Department of Health and Human Services National Institutes of Health National Cancer Institute. Genetics of Breast and Gynecologic Cancers – Health Professional Version (PDQ[®]). Available from: http://www.cancer.gov/ types/breast/hp/breast-ovarian-genetics-pdq. [Last accessed on 2016 Mar 22].
- 40. Canadian Cancer Society. Risk Factors for Breast Cancer; 2016. Available from: http://www.cancer.ca/en/ cancer-information/cancer-type/breast/risks/?region = nl. [Last accessed on 2016 Mar 22].
- Breastcancer.org. Breast Cancer Risk Factors; 2016. Available from: http://www.breastcancer.org/symptoms/ understand_bc/risk/factors. [Last accessed on 2016 Mar 22].
- 42. de Jonge ET, Vlasselaer J, Van de Putte G, Schobbens JC. The construct of breast cancer risk perception: Need for a better risk communication? Facts Views Vis Obgyn 2009;1:122-9.
- 43. Ghanem S, Glaoui M, Elkhoyaali S, Mesmoudi M, Boutayeb S, Errihani H. Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer, Morocco. Pan Afr Med J 2011;10:21.
- Ahmed F, Mahmud S, Hatcher J, Khan SM. Breast cancer risk factor knowledge among nurses in teaching hospitals of Karachi, Pakistan: A cross-sectional study. BMC Nurs 2006;5:6.
- 45. Ibrahim NA, Odusanya OO. Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria. BMC Cancer 2009;9:76.
- 46. Iita SS. Women's Awareness, Knowledge Regarding Health Promotion On Prevention of Breast and Cervical Cancer in Oshakati Health District. Master's Dissertation, University of Namibia. Available from: http://www.isis.unam.na/theses/ iita2009.pdf. [Last accessed on 2016 Mar 22].
- 47. Dündar PE, Ozmen D, Oztürk B, Haspolat G, Akyildiz F, Coban S, *et al.* The knowledge and attitudes of breast self-examination and mammography in a group of women in a rural area in Western Turkey. BMC Cancer 2006;6:43.
- Karayurt O, Ozmen D, Cetinkaya AC. Awareness of breast cancer risk factors and practice of breast self examination among high school students in Turkey. BMC Public Health 2008;8:359.
- 49. Rahman SM, Rahman S. Breast cancer perceptions, knowledge and behavioral practices among women living in a rural community. Int J Canc Prev 2008;2:415-25.
- Komen SG. Facts for Life. Screening and Early Detection; 2015. Available from: http://www. 5.komen.org/

uploadedFiles/_Komen/Content/About_Breast_Cancer/Tools_ and_Resources/Fact_Sheets_and_Breast_Self_Awareness_ Cards/BreastCancerDetection.pdf. [Last accessed on 2016 Mar 22].

51. Pruthi S. With differing mammogram guidelines, I'm not sure when to begin mammogram screening. What does Mayo Clinic recommend? Mayo Clinic; 2016. Available from: http://www.mayoclinic.org/tests-procedures/mammogram/ expert-answers/mammogram-guidelines/faq-20057759. [Last accessed on 2016 Mar 22].

52. Willett AM, Michell MJ, Lee MJ. Best practice diagnostic guidelines for patients presenting with breast symptoms. London: DOH; 2010. Available from: http://www. associationofbreastsurgery.org.uk/media/4585/best_ practice_diagnostic_guidelines_for_patients_presenting_ with_breast_symptoms.pdf. [Last accessed on 2016 Mar 22].