Knowledge and practice of university female students toward breast cancer

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ABSTRACT

Objectives: Breast cancer is the leading cause of death among Saudi females. Knowledge and awareness regarding breast cancer would improve patients' quality of life through early detection of the disease. This study aimed to measure female university students' knowledge and practice regarding breast cancer.

Subjects and Methods: A cross-sectional research design was adopted in this study. A prevalidated questionnaire was developed and distributed to 900 female students using nonprobability convenience sampling technique. A total of 826 valid questionnaires were successfully obtained. Female students were met in the public areas of the females' campus. All data were analyzed using SPSS version 22 at alpha value of 0.05.

Results: Majority of respondents showed low level of knowledge regarding breast cancer. The Internet was the main source of knowledge 53.5%. Moderate knowledge regarding breast cancer symptoms were observed by more than 50% of respondents. Knowledge regarding risk factors was low by majority of respondents >50%. In addition, only 28% of respondents practice breast self-examination (BSE), whereas main barrier for not practicing BSE was the lack of knowledge on how to perform BSE 57.5%.

Conclusion: Students' knowledge and practice toward breast cancer was inadequate. There is a need for national campaigns for the public and university female students to improve their knowledge regarding breast cancer and encourage them for practicing BSE.

Key words: Breast cancer, female students, knowledge, practice, Saudi Arabia

INTRODUCTION

Human cancer is one of the most escalating and increasing diseases worldwide.[1] According to GLOBOCAN 2012, about 14.1 million new cancer cases and 8.2 million cancer-related deaths were estimated by the year 2012. This number is estimated to rise up to 19.3 million by the year 2025.[2] Breast cancer which represents 11.9% of total cancer cases worldwide is the leading cause of death among women. From 2008 to 2012, a total of 20% increase in the incidence of breast cancer cases were estimated, with 14%

increase in mortality rate.[2] In the USA alone, 12% of women were expected to develop breast cancer over the course of their life with 232,670 new cancer cases estimated in 2014.[3]

According to Saudi Ministry of Health, breast cancer is the most common type of cancers affecting women in the Gulf Cooperation Countries.[4] In 2009, number of breast cancer cases in Saudi Arabia raised up to 1308 cases.[5] Where breast cancer represented 23.2% of

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all cancer cases in 2013.[4] In Saudi Arabia, more than 73% of women with breast cancer decide to consult a doctor at a very late stage which is difficult to be cured compared with only 30% of developed countries.[6]

Early detection of breast cancer can increase patients' curing chances and survival rate. Knowledge about breast cancer causes risk factors, and self-examination is the major factors that increase the chances of early detection and better treatment outcomes. Many studies were conducted in developing and developed countries found a low level of knowledge regarding breast cancer, risk factors, and self-examination.[7-10] Where only few number of women who regularly practice breast self-examination (BSE).[11,12]

Few studies were conducted in the Kingdom of Saudi Arabia regarding females' knowledge and awareness about breast cancer but none studied females' practice toward BSE.[7,9,13,14] In addition, university students are the educated category among family members and it is believed that their knowledge and practice would significantly be reflected to the rest of family members. Therefore, this study aims to explore female university students' knowledge about breast cancer, symptoms, and risk factors. In addition, this study aims to explore students' practice of BSE and main barriers of not practicing BSE.

SUBJECTS AND METHODS

Study design
A cross-sectional research design using nonprobability convenience sampling technique was used in this study.

Data collection tool: The questionnaire
The questionnaire was developed after an extensive literature search in the related databases. A first draft was built and validated by an expert team from Clinical Pharmacy Department. Then, the final draft of the questionnaire was built and translated into Arabic language and verified by the same team. Final draft of the Arabic version was piloted on 15 respondents to get their feedback on the questionnaire.

Questionnaire was divided into six parts. First part included the respondents' demographics such as age, gender, and educational level. Second part included respondents' general knowledge toward breast cancer such as prevalence of breast cancer, curability of breast cancer, and whether it could be inherited from relatives or not. Third section included respondents'

knowledge of breast cancer symptoms. Fourth part included respondents' knowledge regarding the risk factors of breast cancer. Fifth part included questions regarding the practice of BSE. Final part included the main barriers toward BSE practice from the perspective of respondents. Answers were designed to be either Yes/No/Do not know or multiple choice questions. It is believed that a higher response rate can be obtained using close-ended type of questions due to the ease of answering them.

Data collection procedure
Researchers met with respondents in public areas at females' campus of the university such as library, canteen, and bookshop. They started by introducing themselves to the students and then informed them that no findings which could identify them will be published and all information will be kept confidential. Researchers gave the questionnaire to those who have agreed to be included in the study. Answering the questionnaire took about 10–15 min to be completed.

Data analysis
Descriptive analysis was used to describe the frequencies and percentages where, Chi-square and Fisher's exact tests were used to measure the association of students' personal data and their responses to the questionnaire. Data obtained from this survey were coded, entered, and then analyzed using IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp., USA. A 95% significant level was used in all data analysis, and any alpha value of <0.05% was considered statistically significant.

RESULTS

As presented in Table 1, a total of 826 responses were collected. Majority of respondents were more than 20-year-old 55.7%, singles 84.3%, living in urban areas 90.1%, with regular menstrual cycle 69.4%, and without family history of breast cancer 90.4%.

Table 2 represents students' general knowledge about breast cancer. About 87% of students believed that breast cancer is the one of the most common cancers in women, and BSE is useful for detecting the disease early. In addition, 89% of students believed that breast cancer is easier to cure when it is detected early, whereas about 80% of them believed that breast cancer is a treatable disease. Breast cancer is the leading cause of death in Saudi women was believed by only 30% of the respondents.

Table 1: General characteristics of the respondents

Demographic characteristics	Frequencies (*n*)	Percentages
Age		
20 years or below	263	31.8
>20 years	460	55.7
Marital status		
Single	696	84.3
Married	109	13.2
Divorced	15	1.8
Widowed	4	0.5
Having children		
Yes	72	8.7
No	745	90.2
Regular menstrual cycle		
Yes	573	69.4
No	242	29.3
Using contraceptives		
Yes	35	4.2
No	778	94.2
Any family history with breast cancer		
Yes	71	8.6
No	747	90.4
Have you ever got breast cancer		
Yes	12	1.5
No	809	97.9
Living area		
Rural	77	9.3
Urban	744	90.1
College		
Education	102	12.3
Admin and financial science	107	13.0
Pharmacy	83	10.0
Medicine	38	4.6
Arts	190	23.0
Design and home economics	38	4.6
Science	144	17.4
Computer and IT	19	2.3
Health sciences	10	1.2
Community and continuous education	32	3.9
Islamic law	42	5.1
Education (year)		
1st	163	19.7
2nd	96	11.6
3rd	180	21.8
4th	160	19.4
5th	89	10.8
6th	78	9.4

IT=Information technology

In addition, when respondents were asked about the source of knowledge regarding breast cancer, Internet was the main source of knowledge regarding breast cancer which was agreed by 54% of respondents.

Whereas television represented 34.2%, friends represented 29%, and radio was the least source of information which was presented by only 6% of respondents.

Table 3 shows students' knowledge about the common symptoms of breast cancer. About 70% of students believed that change in breast shape or mass is symptoms of breast cancer development. Whereas only one-third of them 37% believed that nipple retraction is a symptom of developing breast cancer.

Table 4 shows students' knowledge toward the risk factors of breast cancer development. About 46% of respondents believed that family history with breast cancer is a risk factor for cancer development. A bit more than one-third of respondents 38% believed that using oral contraceptives is a risk factor for breast cancer development whereas 12% of them believe that using hormone replacement therapy could be a risk factor for breast cancer development. Finally, about 20% of students believed that they are at the risk of developing breast cancer.

On the other hand, when respondents were asked about their practice for BSE, it was found that only 28% of respondents practice BSE. Out of them, only 27% practice BSE once monthly while 38% of them practice BSE less than once every 2 years. Only 31% of them practice BSE after menstrual cycle, whereas 48% of them practice BSE at any time.

Table 5 represents main barriers that students face for practicing BSE. More than 49% of students mentioned that they do not have free time to perform BSE. More than half of the respondents 57% do not know how to perform BSE whereas 50% of respondents do not practice BSE because they are afraid of the test results.

DISCUSSION

Breast cancer is the most common cause of death for women. Early detection can help in treating the disease and improving patients' quality of life. Females' knowledge about breast cancer symptoms and risk factors would significantly help in detecting the disease early. In this study, students showed a low level of knowledge regarding breast cancer where only 29% of respondents believed that breast cancer develops only in one breast. In addition, about 36% of respondents did not know whether all breast lumps are cancers or not. A study conducted on 1000 Arabic-speaking residents in Qatar, found low level of knowledge

Table 2: Public general knowledge towards breast cancer

	n (%)			χ² (P)					
	Yes	No	Do not know	Marital status	Kids	Cycle	Contraceptives	History	College
Breast cancer is the one of the most common cancers in women	710 (86.7)	43 (5.3)	65 (7.9)	0.052	0.103	0.247	0.079	0.523	0.583
Breast cancer only develops in one breast	234 (28.7)	273 (33.5)	308 (37.8)	0.894	0.935	0.505	0.022	0.021	0.088
Women younger than 40 years of age may get breast cancer	543 (67)	62 (7.7)	205 (25.3)	0.007	0.236	0.771	0.580	0.016	0.001
Only females develop breast cancer	380 (47)	273 (33.8)	155 (19.2)	0.391	0.282	0.047	0.739	0.141	<0.000
Breast cancer can be transmitted from one person to another	78 (9.7)	562 (70.2)	161 (20.1)	0.011	0.899	0.563	0.175	<0.000	0.092
Breast cancer is the leading cause of death in Saudi women	241 (30.4)	216 (27.2)	337 (42.4)	0.149	0.666	0.381	0.834	0.019	0.059
Breast cancer is easier to cure when it is detected early	724 (89.3)	30 (3.7)	56 (6.9)	<0.000	0.018	0.748	0.005	0.126	0.034
BSE is useful for finding the disease early	710 (87.1)	30 (3.7)	75 (9.2)	0.325	0.956	0.275	0.707	0.178	<0.000
Breast feeding protects the woman from breast cancer	605 (74.5)	27 (3.3)	180 (22.2)	0.029	0.114	0.857	0.877	0.615	0.678
Is breast cancer a treatable disease?	651 (80.2)	39 (4.8)	122 (15.0)	0.199	0.377	0.398	0.062	0.219	0.109
All breast lumps are cancers?	67 (8.3)	450 (55.6)	293 (36.2)	0.007	0.297	0.590	0.382	<0.000	0.001
Have you heard about BSE?	590 (72.5)	136 (16.7)	85 (10.4)	0.570	0.627	0.321	0.122	0.725	0.105

Kids=Having kids, Cycle=Regular and irregular menstrual cycle, Contraceptives=Using contraceptives, History=Family history with breast cancer, College=College of study, BSE=Breast self-examination

Table 3: Symptoms of breast cancer

	n (%)			χ² (P)					
	Yes	No	Don't know	Marital status	Kids	Cycle	Contraceptives	History	College
Painless lump in the breast or axilla	430 (53.3)	148 (18.4)	228 (28.3)	0.784	0.696	0.521	0.648	0.014	0.002
Change in the breast shape or volume	568 (70.5)	76 (9.4)	162 (20.1)	0.410	0.310	0.017	0.020	0.858	0.009
Bloody or any discharge	415 (51.6)	114 (14.2)	276 (34.3)	0.907	0.480	0.601	0.559	0.027	0.143
Changes in the skin of the breast	424 (52.6)	97 (12.0)	285 (35.4)	0.971	0.699	0.549	0.072	0.182	0.524
Nipple retraction	293 (36.7)	111 (13.9)	394 (49.4)	0.920	0.815	0.693	0.199	0.039	0.185
Painful mass in the breast or armpit	468 (57.8)	124 (15.3)	217 (26.8)	0.678	0.159	0.756	0.161	0.868	<0.001
Lump under armpit	407 (50.6)	129 (16.0)	268 (33.3)	0.689	0.273	0.616	0.708	0.166	0.002

Kids=Having kids, Cycle=Regular and irregular menstrual cycle, Contraceptives=Using contraceptives, History=Family history with breast cancer, College=College of study

regarding breast cancer. In which about 57% of their respondents believed that nothing can be done to prevent breast cancer.[15] Another study conducted in Bahrain found that about 95% of respondents had low level of knowledge regarding breast cancer.[16] A study on 12 cancer patients in Malaysia investigated the reasons for delaying seeking help after breast cancer diagnosis found that poor knowledge on cancer, fear of cancer consequences, and beliefs in complementary and alternative medicines were the main reasons of delaying help-seeking.[17] Few other studies found inadequate level of knowledge among females regarding breast cancer.[10,18] The Internet and television were the main sources of knowledge regarding breast cancer among our respondents 53% and 34%, respectively. Other studies conducted in different parts of the developing countries such as, Saudi Arabia, Iran, Pakistan, Bahrain, Egypt, and Nigeria, found radio and television as the main sources of knowledge regarding breast cancer.[7,12,16,18-20] About 50% of our respondents showed good knowledge regarding symptoms of breast cancer. Whereas the

Table 4: Risk factors of breast cancer development

	n (%)			χ^2 (P)					
	Yes	No	Don't know	Marital status	Kids	Cycle	Contraceptives	History	College
Old age	261 (33.2)	311 (39.5)	215 (27.3)	0.603	0.337	0.514	0.129	0.098	<0.001
Family history of breast cancer	362 (46.2)	297 (37.9)	78 (15.6)	0.040	0.019	0.190	0.231	<0.001	<0.001
Cigarette smoking	348 (44.6)	199 (25.5)	233 (29.9)	0.133	0.402	0.422	0.033	0.239	0.049
Low fat diet	115 (14.8)	286 (36.8)	376 (48.3)	0.133	0.014	0.358	0.011	0.445	0.066
First child after the age of 30 years	111 (14.2)	225 (28.9)	443 (56.9)	0.484	0.074	0.777	0.276	0.487	0.134
Early onset of menses (before the age of 12 years)	79 (10.1)	289 (37.1)	411 (52.8)	0.113	0.356	0.497	0.136	0.678	0.059
Late menopause (after the age of 55 years)	148 (18.9)	211 (26.9)	422 (53.8)	0.046	0.061	0.918	0.264	0.273	0.412
Use of oral contraceptive	295 (38.1)	139 (17.9)	341 (44.0)	0.084	0.002	0.803	0.061	0.169	0.012
Large breasts	121 (15.6)	352 (45.4)	301 (38.8)	0.283	0.370	0.007	0.143	0.003	0.001
Breastfeeding	78 (10.0)	492 (63.1)	209 (26.8)	0.093	0.017	0.979	0.238	0.018	0.099
Women who have never lactated	309 (39.3)	163 (20.7)	314 (39.9)	0.042	0.115	0.173	0.129	0.637	0.745
Do you think you are at risk for breast cancer?	159 (20.5)	219 (28.2)	398 (51.3)	<0.000	0.031	0.697	0.011	0.402	0.477
Use of hormone replacement therapy	92 (11.8)	579 (74.3)	108 (13.9)	0.655	0.255	0.804	0.017	0.001	0.014
Obesity or overweight after menopause	177 (22.6)	166 (21.2)	437 (55.9)	0.280	0.580	0.803	0.374	0.257	0.295

Kids=Having kids, Cycle=Regular and irregular menstrual cycle, Contraceptives=Using contraceptives, History=Family history with breast cancer, College=College of study

Table 5: Barriers towards breast self-examination practice

Which of the followings is/are perceived barriers towards performing BSE?	n (%)		χ^2 (P)					
	Yes	No	Marital status	Kids	Cycle	Contraceptives	History	College
I do not have free time	390 (49.1)	402 (50.6)	0.263	0.193	0.664	0.300	0.759	0.034
I still don't know how to do BSE	454 (57.5)	335 (42.5)	0.630	0.640	0.794	0.521	0.154	0.004
I do not feel that I am at risk of breast cancer	426 (54.1)	359 (45.6)	0.221	0.216	0.884	0.879	0.150	0.004
I am afraid that X-ray is harmful	406 (51.8)	377 (48.1)	0.382	0.510	0.028	0.524	0.074	0.315
I do not get any encouragement from my family	374 (48.1)	402 (51.7)	0.016	0.012	0.020	1.000	0.913	0.094
My husband did not approve my going for the test (if you marred)	67 (17.1)	324 (82.7)	0.123	0.051	0.929	0.517	0.624	0.189
I am afraid from the result of the test	399 (50.8)	383 (48.8)	0.256	0.052	0.106	0.777	0.303	0.017
I think the examination is painful	289 (37.1)	488 (62.6)	0.158	0.071	0.307	0.881	0.048	0.080
lack of privacy	297 (38.0)	482 (61.6)	0.409	0.272	0.462	0.059	0.082	0.825

Kids=Having kids, Cycle=Regular and irregular menstrual cycle, Contraceptives=Using contraceptives, History=Family history with breast cancer, College=College of study, BSE=Breast self-examination

other 50% either have wrong knowledge or don't know the main symptoms of breast cancer. A similar findings were found in studies conducted among female students in Al-Madina Al-Monawara and Malaysia.[7,21,22] On the other hand, better level of knowledge regarding breast cancer symptoms was found in a study conducted among 250 Malaysian women.[23]

Risk factors were not well known among our respondents. Similar findings were found in the studies conducted in Malaysia,[22] Egypt,[19] and Bahrain.[16] Practicing BSE at the right time is very helpful in detecting breast cancer, especially for those who are at the risk of developing breast cancer. In this study, a bit more than one-quarter of our respondents 28% performs BSE, and only 36% of them practice BSE once or more every month. Few other studies found similar findings in which 37% of Malaysian female university students practiced BSE[21] and only 19% practice BSE in a study conducted among females in North Nigeria[24] and 17% of respondents in Iranian study.[12] Better findings were found in a study conducted among Turkish academicians where 68% of

them perform BSE, but only 16% practice it monthly.[11] Practicing BSE is associated with knowledge and educational level.[18] In this study, knowledge on how to perform BSE was the main barrier to perform BSE 58% followed by feeling not being on risk for breast cancer development 54% and being afraid of the test results 51%. Similar findings were found in a study performed among females residing in Jeddah found that about 53% of their respondents were not aware how to perform BSE. Other studies in Nigeria, Malaysia, and Saudi Arabia found knowledge on performing BSE to be inadequate 39%, 30%, and 35%, respectively.[7,24,25] Students and public need to be educated about breast cancer and the proper methods and periods of investigation which will definitely improve public awareness and encourage them to regularly perform BSE, especially those who are at the risk of developing breast cancer. Few studies in Malaysia and Jordan found that educational and awareness programs among females resulted in a significant increase in the number of females who regularly perform BSE.[25,26]

CONCLUSION

Female students have shown low level of knowledge regarding breast cancer and its risk factors. BSE practice was inadequate and very few numbers of respondents practice BSE at the right time. The main barrier for not practicing BSE was knowledge on how to perform BSE. Therefore, authorities and policy makers have to design and plan for educational and awareness programs to the public and include topics related to breast cancer awareness and self-examination practice in the curriculum of high school and university female students regardless of their area of specialization.

REFERENCES

1. Sasco AJ. Cancer and globalization. Biomed Pharmacother 2008;62:110-21.
2. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, *et al*. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11. Lyon, France: International Agency for Research on Cancer; 2012.
3. Breastcancer.Org. U.S. Breast Cancer Statistics Secondary U.S. Breast Cancer Statistics Available from: http://www.breastcancer.org/symptoms/understand_bc/statistics. [Last accessed on 2015 Jan 10].
4. Saudi Ministry of Health. Breast Cancer Awareness Month. Secondary Breast Cancer Awareness Month; 2013. Available from: http://www.moh.gov.sa/en/HealthAwareness/healthDay/2013/Pages/HealthDay-023.aspx. [Last accessed on 2015 Jan 6].
5. Saudi Ministry of Health. Breast Cancer Awareness Month. Secondary Breast Cancer Awareness Month; 2014. Available from: http://www.moh.gov.sa/en/HealthAwareness/healthDay/2014/Pages/HealthDay-2014-10-001.aspx. [Last accessed on 2015 Jan 15].
6. Saudi Ministry of Health. National Campaign for Breast Cancer Awareness. Secondary National Campaign for Breast Cancer Awareness; 2012. Available from: http://www.moh.gov.sa/en/HealthAwareness/Campaigns/Breastcancer/Pages/default.aspx. [Last accessed on 2015 Feb 05].
7. Habib F, Salman S, Safwat M, Shalaby S. Awareness and knowledge of breast cancer among university students in Al Madina Al Munawara region. Middle East J Cancer 2010;1:159-66.
8. Karadag G, Gungormus Z, Surucu R, Savas E, Bicer F. Awareness and practices regarding breast and cervical cancer among Turkish women in Gazientep. Asian Pac J Cancer Prev 2014;15:1093-8.
9. Radi SM. Breast cancer awareness among Saudi females in Jeddah. Asian Pac J Cancer Prev 2013;14:4307-12.
10. Parsa P, Kandiah M, Mohd Zulkefli NA, Rahman HA. Knowledge and behavior regarding breast cancer screening among female teachers in Selangor, Malaysia. Asian Pac J Cancer Prev 2008;9:221-7.
11. Avci IA, Kumcagiz H, Altinel B, Caloglu A. Turkish female academician self-esteem and health beliefs for breast cancer screening. Asian Pac J Cancer Prev 2014;15:155-60.
12. Montazeri A, Vahdaninia M, Harirchi I, Harirchi AM, Sajadian A, Khaleghi F, *et al*. Breast cancer in Iran: Need for greater women awareness of warning signs and effective screening methods. Asia Pac Fam Med 2008;7:6.
13. Milaat WA. Knowledge of secondary-school female students on breast cancer and breast self-examination in Jeddah, Saudi Arabia. East Mediterr Health J 2000;6:338-44.
14. Sait WA, Al-Amoudi SM, Tawtai DA, Abduljabbar HS. The knowledge of breast cancer among young Saudi females. Saudi Med J 2010;31:1242-4.
15. Donnelly TT, Al Khater AH, Al-Bader SB, Al Kuwari MG, Al-Meer N, Malik M, *et al*. Beliefs and attitudes about breast cancer and screening practices among Arab women living in Qatar: A cross-sectional study. BMC Womens Health 2013;13:1-16.
16. Fikree M, Hamadeh RR. Breast cancer knowledge among

Bahraini women attending primary health care centers. Bahrain Med Bull 2011;33:1-8.

17. Norsa'adah B, Rahmah MA, Rampal KG, Knight A. Understanding barriers to Malaysian women with breast cancer seeking help. Asian Pac J Cancer Prev 2012;13:3723-30.

18. Khokher S, Qureshi W, Mahmood S, Saleem A, Mahmud S. Knowledge, attitude and preventive practices of women for breast cancer in the educational institutions of Lahore, Pakistan. Asian Pac J Cancer Prev 2011;12:2419-24.

19. Allam MF, Abd Elaziz KM. Evaluation of the level of knowledge of Egyptian women of breast cancer and its risk factors. A cross sectional study. J Prev Med Hyg 2012;53:195-8.

20. Irurhe NK, Raji SB, Olowoyeye OA, Adeyomoye AO, Arogundade RA, Soyebi KO, *et al*. Knowledge and awareness of breast cancer among female secondary school students in Nigeria. Acad J Cancer Res 2012;1:1-5.

21. Akhtari-Zavare M, Juni MH, Manaf RA, Ismail IZ, Said SM. Knowledge on breast cancer and practice of breast self examination among selected female university students in Malaysia. Med Health Sci J 2011;**7**:49-56.

22. 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.

23. Al-Dubai SA, Qureshi AM, Saif-Ali R, Ganasegeran K, Alwan MR, Hadi JI. Awareness and knowledge of breast cancer and mammography among a group of Malaysian women in Shah Alam. Asian Pac J Cancer Prev 2011;12:2531-8.

24. Omotara B, Yahya S, Amodu M, Bimba J. Awareness, attitude and practice of rural women regarding breast cancer in Northeast Nigeria. Community Med Health Educ 2012;2:5.

25. Loh SY, Chew SL. Awareness and practice of breast self examination among Malaysian women with breast cancer. Asian Pac J Cancer Prev 2011;12:199-202.

26. Taha H, Nyström L, Al-Qutob R, Berggren V, Esmaily H, Wahlström R. Home visits to improve breast health knowledge and screening practices in a less privileged area in Jordan. BMC Public Health 2014;14:428.