

Knowledge, Attitude, Practice, and Associated Factors of Breast Cancer Self-Examination among Urban Health Extension Workers in Addis Ababa, Central Ethiopia

Yosef Zeru (MPH)¹, Lelisa Sena (PhD)², Tamrat Shaweno (MPH)^{3*}

¹ Graduate, Department of Epidemiology, School of Public Health, Jimma University, Ethiopia

² Associate Professor, Department of Epidemiology, School of Public Health, Jimma University, Ethiopia

³ Lecturer, Department of Epidemiology, School of Public Health, Jimma University, Ethiopia

ARTICLE INFO	ABSTRACT
<p><i>Article type:</i> Original article</p>	<p>Background & aim: Breast cancer is one of the leading cancer types among women. In Ethiopia, the knowledge, attitude and practice among health extension workers (HEWs) towards breast cancer self-examination are not well understood. Therefore, this study assessed knowledge, attitude, and practice (KAP) of breast cancer self-examination (BCSE) and associated factors among HEWs.</p> <p>Methods: This cross-sectional study was conducted from October to November 2017 among female HEWs in Addis Ababa, using self-administered questionnaire. Multivariate logistic regression was used to assess factors associated with KAP of the BCSE. Adjusted odds ratio (AOR) with 95% confidence interval (95% CI) was used to assess statistical significance.</p> <p>Results: A total of 453(89.2%) HEWs participated in this study. Close to two-third (64.0%) of the respondents had adequate knowledge on breast cancer signs, symptoms, and practice of BCSE. However, only 146(40.0%) of the respondents practiced BCSE on a monthly basis. The majority (81.0%) of the respondents had a positive attitude towards BCSE. Work experience ranging from one to four years (AOR: 2.8; 95%CI: 1.2, 6.4) and ≥five years (AOR: 2.4; 95%CI: 1.1, 5.7), familiarity with people who had history of breast cancer (AOR: 1.7; 95%CI: 1.1, 2.6), perceived susceptibility (AOR: 1.8; 95 %CI: 1.2, 3.0), and knowledge of BCSE (AOR: 2.3; 95 %CI: 1.4, 3.7) were significant predictors of BCSE.</p> <p>Conclusion: More than half of HEWs had adequate knowledge and attitude towards BCSE; however, only a few put them into practice. With regard to in-service training focusing on severity, consequences and detection methods of breast cancer may enhance the BCSE practices of the HEWs.</p>
<p><i>Article History:</i> Received: 07- Jun-2018 Accepted: 04- Oct-2018</p>	
<p><i>Key words:</i> Knowledge Attitude Practice Breast cancer Self-examination Health extension workers</p>	

► Please cite this paper as:

Zeru Y, Sena L, Shaweno T. Knowledge, Attitude, Practice, and Associated Factors of Breast Cancer Self-Examination among Urban Health Extension Workers in Addis Ababa, Central Ethiopia. Journal of Midwifery and Reproductive Health. 2019; 7(2): 1682-1692. DOI: 10.22038/jmrh.2019.32555.1355

Introduction

Breast cancer is a universally diagnosed type of cancer and the leading cause of cancer death among women. It dramatically increased to 19.7 million cases with 5.8 million deaths at the end of 2014 (1). Middle and low-income countries account for 57% and 65% of cancer cases and deaths, respectively (1-3). Breast cancer encompasses 12% of all cancer types followed by 25% of cancer cases and 15% of cancer deaths among women. Diagnosed cases of breast cancer showed a survival rate below 40% in

developing countries and above 80% in the developed world (3,4).

First birth after the age of 30 years, gene mutation, consumption of alcoholic beverages, use of certain contraceptives, hormonal replacement therapy, exposure to ionizing radiation, high-calorie diets, and lack of exercise are among risk factors for breast cancer (5,6).

The recommended comprehensive control programs include the increase of public awareness, the screen of breast cancer cases

* Corresponding author: Tamrat Shaweno, Lecturer, Department of Epidemiology, School of Public Health, Jimma University, Ethiopia. Tel: 0098912493482; Email: babiynos@gmail.com

using mammography, breast cancer self-examination, and clinical breast examination (7). World health organization and federal ministry of health of Ethiopia (FMOH) recommend breast cancer self-examination as a means of empowering women for their own health(7-9). In 2003, FMOH launched a new health care plan, the "Accelerated Expansion of Primary Health Care Coverage," through a comprehensive health extension program (10), intended to provide primary health care for the families to prevent and control both communicable and non-communicable diseases(10,11).

Almost 80% of cancer cases require surgical oncologic care; however, due to the lack of safe, affordable, and timely surgical service, 75% of the cases from low and middle-income countries (LMICs) are in worse conditions (12,13). The case fatality rate of breast cancer appears to be significantly higher in LMICs than high-income countries. Accordingly, the mortality rates in central Africa and in the United States were estimated at 0.55 and 0.16, respectively (14, 15). This increase in mortality rate is an indication of not only high incidence but also late stage diagnosis and limited access to treatments, such as radiotherapy (14).

A study conducted in Uganda (16) indicated that 77% of the patients presented to treatment at the late stage of malignancy, among which 39% survived at the end of the fifth year. Similar studies conducted in Rwanda (17) and Angola (18) showed that more than 75% of breast cancer patients referred to treatment centers at stages three and four of the disease. The reasons for the delay to treatment included limited knowledge of breast cancer risk factors, low or no screening practices for breast cancer self-examination (BCSE), and misconceptions (14,19).

Cumulative African incidence and death due to breast cancer are 34.5 and 17.2 per 100,000 females (14,20,21). In Ethiopia, hospital-based breast cancer trend analysis of 16 years (1997 to 2012) conducted at Tikur Anbessa Teaching and Referral Hospital indicated an average proportion of 20.8% of breast malignancy. The analysis also showed the increased trend of breast cancer cases over the study period, where the majority of the cases were from Addis Ababa, Ethiopian capital City (22). Even though,

national cancer registry is lacking in Ethiopia, the annual incidence of all cancers is obtained 60,960 cases and the annual mortality has been estimated at or over 40,000 (23). In the country, the prevalence of breast cancer, cervical cancer, and colorectal cancer are estimated at 30.2%,13.4%, and 5.7%, respectively (24).

In spite of the fact that the Federal Ministry of Health advocates breast BCSE as a means of early detection for breast cancer, it is understood that breast cancer had been overlooked and given lesser attention to bring practical behavioral changes (25).

Evidence from Nepal (26) shows that the assessment of knowledge, attitude, and practice (KAP) with BCSE can provide baseline information to design and implement breast cancer screening programs using primary health care providers.

Therefore, the present study aimed at assessing KAP with regard to BCSE and associated factors among urban health extension workers (HEWs) in Addis Ababa.

Materials and Methods

A cross-sectional study was conducted on 508 randomly selected female urban HEWs from October to November 2017. According to 2015 census projection, the total population of the city estimated 3,384,569 during the study period. The city is sub-divided into ten sub-cities, and 116 weredas (i.e., third-level administrative divisions of Ethiopia). Addis Ababa has above 1200 health extension workers who are deployed to all the weredas (27,28). The study population was all female urban HEWs.

In this study, BCSE was defined as the respondent's practice of checking breast for abnormal signs and symptoms on a monthly basis. The respondent who answered correctly to 50% of the items had adequate knowledge, whereas the cases who had less than 50% correct answers were regarded as non-adequate in terms of knowledge (25).

Respondents had "good attitude" towards BCSE if the score of attitude measurement was at least equal to mean scores obtained from information of a 10-item questionnaire based on Likert scale type with 5-response options from "strongly agree" to "strongly disagree".

Otherwise, the respondents were regarded to have “negative attitude” in terms of BCSE.

Moreover, the respondents had “good levels of practice” with BCSE if they answered correctly to at least 50% of knowledge items; however, they were considered to have “poor levels of practice” if they had less than 50% correct responses (25).

The total sample size was determined as 508 cases using a single population proportion formula. In addition, the CI, the prevalence of HEWs knowledge based on a previous study (25), the margin of error ($\alpha = 0.05$), and non-response rate were estimated at 95%, 59 %, 5%, and 10%, respectively.

The study population was less than 10,000; therefore, the finite population correction formula was used. A design effect of 2 was considered to calculate the sample size. Moreover, the multi-stage sampling technique was applied to select the desired sample. At first stage, five of 10 sub-cities were selected randomly and at the second stage, the desired sample was taken proportionally from all weredas. The study subjects were selected by simple random sampling technique using computer-generated a random number from the existing sampling frame of study participants.

The major outcome variables were knowledge, attitude, and practice with regard to BCSE. Independent variables included age, marital status, work experience, in-service training, health checkup, educational status, personal history of breast cancer, and family history of breast cancer.

The BCSE was determined using HEWs practicing index included six questions with equal weight (9). Knowledge of HEWs about BCSE service was measured using 10 knowledge questions from a minimum score of zero (i.e., correct answer) to maximum 10. The items were categorized based on the percentages of knowledge scores of respondents (25). The attitude was measured using the information obtained from a 10-item questionnaire based on Likert scale type with 5-response options from “strongly agree” to “strongly disagree”. The total scores were summed up and the mean score was used to categorize the respondents (9).

A modified, pretested, and structured interview questionnaire adapted from related

literature (9, 25) was used to collect data. The questionnaire was prepared in English language and translated into local language (i.e., Amharic). An independent translator was asked to retranslate it back into English to check its consistency. The instrument included sections, such as the socio-demographic status of the respondents, knowledge of HEWs about BCSE, the attitude of HEWs towards BCSE, history of breast cancer, signs and risk factors for breast cancer, and information source for BCSE.

Data were collected by five grade 12 complete (matriculated for university entrance exam) students who were fluent in Amharic language using administered structured questionnaires. Data collection process was supervised by two students with BSc in nursing. To ensure the quality of data, appropriate data collection tool was designed and pretested. Pretesting was done on 5% of the sample size in another sub-city, which was nearly identical to the study setting. One-day training was given to both data collectors and supervisors on the objectives of the study, data collection tools, interview technique, how to keep confidentiality and approach potential respondents.

Data were analyzed using Epi-data and SPSS (version 20). Frequency tables, graphs and descriptive summaries were used to describe the data. Based on the objective of the study, the association between stated dependent and independent variables were analyzed using bivariate logistic regression and the Chi-Square tests after checking the fulfillment of assumptions.

Variables with $P \leq 0.25$ at bivariate regression analysis level were recruited for multivariate logistic regression. The strength of association between outcome and predictor variables was assessed at $P \leq 0.05$ using adjusted odds ratio (AORs) with corresponding 95% CIs.

Results

A total of 453 (89.2%) HEWs participated in the study. The mean age of the study participants was 27.3 (SD ± 4.1) years. More than 345 (76.2 %) cases were diploma graduates in nursing. About a quarter (26.0 %) of the respondents reported attending in-service training related to non-communicable diseases (Table 1).

Table 1. Socio demographic characteristics of urban HEWs in Addis Ababa, 2017 (N=453)

Characteristics	Categories	N (%)
Age group	≤ 20 Years	8 (1.8)
	21-25 Years	159 (35.1)
	26-30 Years	210 (46.4)
	31-35 Years	59 (13.0)
	≥ 36 Years	17 (3.8)
Marital status	Ever Married	238 (52.5)
	Never Married	215 (47.5)
Religion	Orthodox	333 (73.5)
	Protestant	74 (16.3)
	Muslim	46 (10.2)
Educational status	Diploma	345 (76.2)
	Degree	108 (23.8)
Work experience	< 1 Years	54 (11.9)
	1 - 4 Years	233 (51.4)
	5 - 8 Years	160 (35.3)
	> 8 Years	6 (1.3)
Trained on NCDs	Yes	118 (26)
	No	335 (74)

HEWs: Health Extension Workers
NCDs: Non-Communicable Diseases

Nearly, 64.0% of the study participants had adequate knowledge of BCSE. Some of the signs of breast cancer mentioned by the respondents were lump (78.1%), nipple discharge (50.1%), breast pain (42.6%), and breast size change (42.4%). Moreover, less than half (43.7%) of the HEWs knew all the three breast cancer

screening methods. However, 18.8%, 17.9%, and 9.9% of the study participants had familiarity with a mammogram, BCSE, and clinical breast examination (CBE), respectively. Only two participants mentioned culture biopsy as a screening method (Table 2).

More than three-fourths (79.2%) of the respondents reported practicing BCSE. In addition, only 40.7% and 37.3% of the subjects reported to practice it on a monthly and weekly basis, respectively. Although, the proper physiological time to practice BCSE is after menarche, only about half (53.8%) of the study participants reported to do it.

Among those who practiced BCSE, the majority of them (88.6%) performed BCSE within one month preceding the study, whereas the rest couldn't remember the last time they practiced BCSE.

Those who never practiced BCSE (20.8%) mentioned such reasons as a sense of well-being (6%), unfamiliarity with the technique (5.7%), and negligence about breast cancer (4.4%).

Majority of the respondents (81%) had a positive attitude to practice BCSE. More than half (57.4%) of the respondents agreed that they are susceptible to breast cancer. Furthermore,

Table 2. Responses of urban health extension workers on BCSE Assessment, 2017

Knowledge on BSE	Categories	N (%)
Recommended Age to Start BSE	Correct Response (18 years)	122 (26.9)
	Incorrect Response	331 (73.1)
Frequency of BSE	Correct Response (Once a month)	188 (41.5)
	Incorrect Responses	265 (58.5)
Women's chance of getting breast cancer	Yes	224 (49.4)
	No	229 (50.6)
Breast Cancer is Communicable	Yes	31 (6.8)
	No	422 (93.2)
Breast Cancer is Fatal	Yes	412 (90.9)
	No	41 (9.1)
Breast Cancer is Treatable	Yes	428 (94.5)
	No	25 (5.5)
Minutes need to breast self-exam	Correct Response (5 minutes)	152 (33.6)
	Incorrect Response	301 (66.4)

BSE: Breast Self-Examination

more than two-thirds (69.3%) of the subjects agreed that breast cancer is serious and most (86.1%) of the respondents agreed that early self-examination can save their lives or serious

complications of breast cancer. Therefore, HEWs who agreed on perceived seriousness of women to breast cancer were 2.3 times more likely be knowledgeable (AOR: 2.3; 95% CI: 1.5, 3.5),

compared to those who disagree with the perceived seriousness of breast cancer (Table 3).

Table 3. Factors affecting Knowledge of BCSE among HEWs in Addis Ababa, 2017

Characteristics	Categories	Knowledge of BCSE		COR(95% CI)	AOR(95%CI)
		Inadequate (163)	Adequate(290)		
Age in years	≤ 20	4	4	0.9 (0.2, 4.8)	
	21-25	57	102	1.6 (0.6, 4.4)	
	26-30	73	137	1.7 (0.6, 4.5)	
	31-35	21	38	1.6 (0.54, 4.8)	
	≥ 36	8	9	1	
Marital status	Single	88	127	1	1
	Married	75	163	1.5 (1.0, 2.2)	1.5 (0.98, 2.2)
Religion	Orthodox	119	214	1.03 (0.6, 1.7)	
	Muslim	17	29	0.98 (0.5, 2.1)	
	Protestant	27	47	1	
Educational Status	Diploma	125	345	0.95 (0.6, 1.5)	
	Degree	38	70	1	
Work Experience in years	< 1	20	34	1	
	1 to 4	88	145	1.0 (0.5, 1.8)	
	≥ 5	55	11	1.2 (0.6, 2.3)	
Trained on NCDs	Yes	42	76	1.02 (0.7, 1.6)	
	No	121	214	1	
Family history of breast cancer	Yes	10	31	1.8 (0.9,3.8)	1.4 (0.7, 3.1)
	No	153	259	1	1
Know people with CS	Yes	55	110	1.2 (0.8, 1.8)	
	No	108	180	1	
Susceptibility to breast Cancer	Agree	53	139	1.9 (1.3, 2.9)	1.5 (1.0, 2.3)
	Disagree	110	150	1	1
Perceived seriousness	Agree	92	222	2.5 (1.7, 3.8)	2.3 (1.5, 3.5) *
	Disagree	71	68	1	1
Perceived barrier to BSE	Agree	145	259	1.04 (0.6, 1.9)	
	Disagree	18	31	1	

* - Statistically Significant, COR: Crude Odds Ratio, AOR: Adjusted Odds Ratio

BCSE: Breast Cancer Self-Examination

NCDs: Non-Communicable Diseases

BSE: Breast Self-Examination

HEWs: Health Extension Workers

There is a positive statistically significant association between the familiarity with people who live with breast cancer and the attitude towards BCSE. The HEWs who knew someone with breast cancer were two times more likely to have a positive attitude towards BCSE practice (AOR: 2.0; 95% CI: 1.1, 3.3), compared to those who didn't know anyone with breast cancer. Similarly, HEWs who have adequate knowledge were four times more likely to have a positive attitude (AOR: 4.0; 95% CI: 2.3, 6.3) towards BCSE practice, compared to those with inadequate knowledge (Table 4).

A significant association was also observed between the work experience of the HEWs, BCSE knowledge, and perceived susceptibility

to breast cancer with the practice of the respondents. The HEWs who had work experience of one to four years, and ≥ five years were 2.8 (AOR: 2.8; 95 % CI: 1.2, 6.5) times and 2.5 (AOR: 2.4; 95% CI: 1.1, 5.9) times more likely to practice BCSE, respectively, compared to HEWs whose work experience was less than a year in their current job. The HEWs who didn't know other people with a history of breast cancer were 1.7 (AOR: 1.7; 95% CI: 1.1, 2.6) times more likely to practice BCSE, compared to colleagues who knew people with a history of breast cancer.

The HEWs who perceived that they were not susceptible to breast cancer were nearly two times more likely (AOR: 1.8; 95% CI: 1.2, 3.0) to

practice BCSE, compared to HEWs who perceived that they were susceptible to breast cancer. In addition, HEWs who had adequate knowledge of BCSE were more than two times

more likely (AOR: 2.3; 95% CI: 1.4, 3.7) to practice BCSE, compared to HEWs with inadequate knowledge of BCSE (Table 5).

Table 4. Factors affecting attitude towards BCSE practice among HEWs in Addis Ababa, 2017

Variable	Categories	Attitude towards BCSE		COR (95% CI)	AOR (95% CI)
		Agree (367)	Disagree (85)		
Age in years	≤ 20	6	2	0.2 (0.14, 2.5)	0.3 (0.02, 3.3)
	21-25	129	30	0.3 (0.03, 2.1)	0.3 (0.03, 2.0)
	26-30	164	45	0.23 (0.03, 1.8)	0.2 (0.02, 1.6)
	31-35	52	7	0.5 (0.05, 4.1)	0.4 (0.04, 3.5)
	≥ 36	16	1	1	1
Marital Status	Never Married	167	47	0.7 (0.4, 1.1)	0.8 (0.5, 1.5)
	Ever Married	200	38	1	1
Religion	Orthodox	230	103	1.2 (0.7, 2.2)	
	Muslim	30	16	1.5 (0.6, 4.1)	
	Protestant	47	27	1	
Educational Status	Diploma	279	66	0.9 (0.5, 1.6)	
	Degree	88	19	1	
Work Experience in years	< 1	43	11	1	1
	1 to 4	181	52	0.9 (0.43, 1.9)	0.8 (0.4, 2.0)
	≥ 5	143	22	1.7 (0.8, 3.8)	1.5 (0.6, 3.8)
Trained on NCDs	Yes	101	17	1.5 (0.9, 2.7)	1.5 (0.8, 2.7)
	No	266	68	1	1
Status Health Checkup	Yes	103	21	1.2 (0.7, 2.1)	
	No	264	64	1	
Family History of Breast Cancer	Yes	37	4	2.3 (0.9, 6.6)	1.4 (0.5, 4.2)
	No	330	81	1	1
Know Person with Breast Ca	Yes	143	21	2.0 (1.2, 3.3)	2.0 (1.1, 3.3) *
	No	224	64	1	1
BSE Knowledge	Adequate	257	32	3.9 (2.4, 6.3)	4.0 (2.3, 6.3) *
	Inadequate	110	53	1	1

BCSE: Breast Cancer Self-Examination

BSE: Breast Self-Examination

HEWs: Health Extension Workers

AOR: Adjusted odds ratio

Discussion

This study aimed to assess the level of knowledge, attitude and practice as well as associated factors among HEWs in Addis Ababa. Nearly two-thirds of the HEWs had adequate knowledge in terms of breast cancer and risk factors. This finding is slightly comparable to a similar study conducted in Gojjam, north-west Ethiopia (25).

This discrepancy may be due to the difference in training background as the HEWs in Addis Ababa are nurses and those in Gojjam were below college diploma. On the other hand, the present finding is comparable with the findings of a study conducted in South India (29)

among nurses.

In this study, the most cited signs and symptoms of breast cancer were a lump, nipple discharge, nipple retraction, and breast size change. The present findings are not consistent with the findings of a study conducted in Nigeria (30) among primary health care nurses. The difference might have been attributed to variations in educational status (only 5 % of the study participants were first degree holders in Nigerian study) and study setting (most of the study participants from Nigeria were from the rural setting) which may hinder the access to media and health information.

Table 5. Factors associated with BCSE practice among HEWs in Addis Ababa, 2017

Characteristics	Categories	Practice of BCSE		COR (95% CI)	AOR (95% CI)
		Yes (146)	No(307)		
Age in years	≤ 20	1	7	0.7 (0.1, 7.6)	2.9 (0.2, 49.0)
	21-25	52	107	2.3 (0.62, 8.2)	3.5 (0.9, 14.5)
	26-30	72	138	2.4 (0.7, 8.8)	2.6 (0.7, 10.0)
	31-35	18	41	2.1 (0.5, 8.0)	2.4 (0.6, 10.0)
	≥ 36	3	14	1	
Marital Status	Never married	148	67	0.9 (0.6, 1.4)	
	Ever Married	159	79	1	
Religion	Orthodox	230	103	0.8 (0.5, 1.3)	
	Muslim	30	16	0.9 (0.4, 2.0)	
	Protestant	47	27	1	
Educational Status	Diploma	239	106	0.8 (0.5, 1.2)	1.0 (0.6, 1.6)
	Degree	68	40	1	1
Work Experience in years	< 1	9	45	1	1
	1 to 4	81	152	2.7 (1.2, 5.7)	2.8 (1.2, 6.5) *
	≥ 5	56	110	2.5 (1.2, 5.6)	2.5 (1.1, 5.9) *
Trained on NCDs	Yes	83	35	0.9 (0.5, 1.3)	
	No	224	111	1	
Family History of breast Cancer	Yes	28	13	1.0 (0.5, 1.9)	
	No	279	133	1	
Familiarity with others with breast cancer	Yes	120	45	1	1
	No	187	101	1.4 (1.0, 2.2)	1.7 (1.1, 2.6) *
Confidence of practice (BSE)	Yes	157	116	1.4 (0.8, 2.3)	1.4 (0.8, 2.3)
	No	56	30	1	1
Susceptibility to breast Cancer	Agree	139	53	1	1
	Disagree	167	93	1.5 (1.0, 2.2)	1.8 (1.2, 3.0) *
Seriousness of breast Cancer	Agree	214	100	1.0 (0.6, 1.5)	
	Disagree	93	46	1	
Barrier to BSE	Agree	271	133	1.4 (0.7, 2.7)	
	Disagree	36	13	1	
BSE Knowledge	Adequate	127	110	2.2 (1.4, 3.4)	2.3 (1.4, 3.7) *
	Inadequate	180	136	1	1

BCSE: Breast Cancer Self-Examination

BSE: Breast Self-Examination

HEWs: Health Extension Workers

AOR: Adjusted odds ratio

The most mentioned risk factors for breast cancer by HEWs were high dose radiation, smoking, alcohol consumption, and family history of breast cancer. The findings of this study are not in line with a previous study (31) conducted in Addis Ababa Government Hospitals among female health care providers.

The differences might be due to variations within the study participants. Nearly 70% of the study participants in the hospitals were nurses, whereas the rest were from other paramedical staffs with different level of education.

Moreover, work experience in hospitals

might have exposed the paramedical staffs to patients with breast cancers, which in turn imparts more knowledge of the disease to the hospital workers.

With regard to the knowledge on three screening methods (Mammogram, Breast Self-Examination (BSE) , and CBE for cancer), the study participants were less knowledgeable, compared to those participating in the earlier study in Addis Ababa (31). However, they had more familiarity with the screening approaches, compared to a study carried out in Nigeria (32). This might be due to the fact that nurses work in

hospitals, whereas HEWs work in-home community-based services. Accordingly, nurses who work in hospitals can have better knowledge due to exposure to breast cancer patients. Additionally, low access to information, small sample size, and differences in curricula training can also account for the differences in terms of knowledge among participants.

The study participants were less aware of the proper age to start BCSE, compared to the subjects in a study conducted in Turkey (33). The discrepancy may be due to sampling variation, different sources of information, and variation in duration to get access to media. Breast cancer prevention and control activities were started long ago in Turkey, whereas it has been advocated in Ethiopia only during the past few years.

With regard to the proper physiological time to practice BCSE (recommended after menarche) (26), the study participants were more aware, compared to the findings of a study conducted in Adama Science and Technology University (34). The variation might be due to the fact that the present study was performed among HEWs who were health professionals, whereas the earlier study was conducted among university students who were not health professionals.

In terms of the attitude of the HEWs to practice BCSE, studies from Iraq (35) and Addis Ababa Government Hospitals (31) reported similar findings; however, the study from Nigeria (32) reported lower levels of attitude to practice BCSE. The variation may be due to the difference in sample size (i.e., the Nigerian study sampled only 100 health care providers from different disciplines) and educational background of the study participants. In this study, the proportion of HEWs who reported to practice BCSE on a monthly basis was higher, compared to the findings of studies conducted in West Gojjam (25) and Malaysia (36). This variation may be due to the difference in the study setting and knowledge of the study participants.

Study participants who agreed on the seriousness of breast cancer were 2.3 times more likely to have adequate knowledge of BCSE than those who didn't agree with the seriousness of the breast cancer. This finding

agrees with the theory that women were more likely to perform BCSE when they believe in the seriousness of breast cancer and its consequence for individual health. The study conducted in Adama (34) showed similar findings that students who had a positive attitude were six times more likely to practice BCSE than their counterparts.

The HEWs who perceived that they were not susceptible to breast cancer were 1.8 times more likely to practice BCSE, compared to those who perceived that they were susceptible to breast cancer. This finding is consistent with the results of a study carried out in Lebanon (37). The forementioned study revealed that women with a higher perception of the seriousness of breast cancer were less likely to practice BCSE, compared to their counterparts. This may be due to an exaggerated fear of breast cancer seriousness or the probability of detecting breast problems by breast self-examination.

Study participants who know someone with breast cancer were nearly two times more likely to practice BCSE than those who don't know people with breast cancer. This may be due to shared experience, familiarity with patients living normal lives without complications, and the understanding that breast cancer can be treated if detected very early. The HEWs with work experience of one to eight years were more likely to practice BCSE, compared to those who had less than one-year work experience.

This can be due to the fact that experience increases exposure to cases of breast cancer which enhances BCSE practice. According to a study conducted in Turkey (30) there was a significant association between work experience and practice of BCSE.

In the current study, HEWs who had adequate knowledge of BCSE were two times more likely to practice it, compared to those who lacked adequate knowledge. Studies conducted in Debre Berhan (38) and Rift Valley Universities, central Ethiopia, showed similar findings. They revealed that study participants who knew how and when to perform BCSE were more likely to practice BCSE as compared to those who did not know.

Conclusion

In Ethiopia, the urban health extension program has started relatively recently. Therefore, similar studies are rare on the topic among the comparable study population, which limits the generalizability of the results. Additionally, the findings of the present study can be limited to determine the causal relationship between the dependent and explanatory variables emerged from cross-sectional nature of the study design. Self-reporting of behavior can be affected by social desirability bias where the study participants tend to report expected practices. Furthermore, the unavailability of internationally agreed standard questions for the assessment of KAP of the study participants may create differences across studies which might affect comparisons.

Majority of the HEWs had adequate knowledge and good attitude towards BCSE. However, only a few of them practiced on the recommended monthly basis. The low levels of BCSE practice among the HEWs was associated with work experience, knowledge of another person with a history of breast cancer, perceived susceptibility to breast cancer, and respondents' knowledge of BCSE. The close monitoring of HEWs during early employment period, unfolding of others with a history of breast cancer, and increasing perceived susceptibility to breast cancer among HEWs are important to improve KAP of the HEWs.

Acknowledgements

The study was approved by the Institutional Review Board, Institute of Health, Jimma University (JUIH) and Addis Ababa City Administration Health Bureau. Written informed consent was obtained from all study participants. In order to ensure privacy and confidentiality, name or any other unique identifier of respondents was not recorded in the study.

The authors would like to express their gratitude to the study participants, data collectors, and supervisors.

Conflicts of interest

The authors declare no conflict of interest.

References

1. Gham K, Hakam Y, Kaza N, Mikhail M, Morton Doherty R, Tasker R, et al. World cancer declaration progress report. Geneva, Switzerland: Union of International Cancer Control; 2016.
2. World Health Organization. Cancer control: a global snapshot in 2015. Geneva, Switzerland: World Health Organization; 2015.
3. Stewart BW, Wild CP. World cancer report 2014. Lyon, France: International Agency for Research on Cancer, World Health Organization; 2014.
4. World Health Organization. The transformation agenda of the World Health Organization secretariat in the African region 2015-2020. Geneva, Switzerland: World Health Organization; 2015.
5. Eble JN, Tavassoli FA, Devilee P. Pathology and genetics of tumours of the breast and female genital organs. Lyon: IARC Press; 2003.
6. World Health Organization. Breast cancer fact sheet. Geneva, Switzerland: World Health Organization; 2017.
7. The Ethiopian Federal Ministry of Health (FMOH). Non-communicable disease prevention and control health extension package. Addis Ababa: Ethiopian Federal Ministry of Health; 2015. P. 35.
8. World Health Organization. Breast cancer: prevention and control. Geneva, Switzerland: World Health Organization; 2017.
9. Loh KP, Stefan MS, Friderici J, Tan EK, Ogunneye O, Kleppel R, et al. Healthcare professionals' perceptions and knowledge of the USPSTF guidelines on breast self-examination. Southern Medical Journal. 2015; 108(8):459-462.
10. Wang H, Tesfaye R, Ramana G, Chekagn CT. Ethiopia health extension program: an institutionalized community approach for universal health coverage. Washington, D.C: The World Bank; 2016.
11. Kume DA, Wubishet DM, Tadesse DT, Worku MW, Taye MS. Strengthening Ethiopia's urban health program. Boston: John Snow Inc; 2015.
12. Pace LE, Shulman LN. Breast cancer in sub-Saharan Africa: challenges and opportunities to reduce mortality. The Oncologist. 2016; 21(6):739-744.
13. Sullivan R, Alatisse OI, Anderson BO, Audisio R, Autier P, Aggarwal A, et al. Global cancer surgery: delivering safe, affordable, and timely cancer surgery. The Lancet Oncology. 2015;

- 16(11):1193-1224.
14. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012: Globocan 2012. *International Journal of Cancer*. 2015; 136(5): E359-E386.
 15. Anderson BO, Ilbawi AM, El Saghir NS. Breast cancer in low and middle income countries (LMICs): a shifting tide in global health. *The Breast Journal*. 2015; 21(1):111-118.
 16. Gakwaya A, Kigula-Mugambe JB, Kavuma A, Luwaga A, Fualal J, Jombwe J, et al. Cancer of the breast: 5-year survival in a tertiary hospital in Uganda. *British Journal of Cancer*. 2008; 99(1):63-67.
 17. Pace LE, Dusengimana JM, Hategekimana V, Habineza H, Bigirimana JB, Tapela N, et al. Benign and malignant breast disease at Rwanda's first public cancer referral center. *The Oncologist*. 2016; 21(5):571-575.
 18. Lopes LV, Miguel F, Freitas H, Tavares A, Pangui S, Castro C, et al. Stage at presentation of breast cancer in Luanda, Angola—a retrospective study. *BMC Health Services Research*. 2015; 15(1):471.
 19. Akuoko CP, Armah E, Sarpong T, Quansah DY, Amankwaa I, Boateng D. Barriers to early presentation and diagnosis of breast cancer among African women living in sub-Saharan Africa. *PLoS One*. 2017; 12(2):e0171024.
 20. Abuidris DO, Elsheikh A, Ali M, Musa H, Elgaili E, Ahmed AO, et al. Breast-cancer screening with trained volunteers in a rural area of Sudan: a pilot study. *The Lancet Oncology*. 2013; 14(4):363-370.
 21. Kantelhardt EJ, Frie KG. How advanced is breast cancer in Africa? *The Lancet Global Health*. 2016; 4(12):e875-e876.
 22. Abate SM. Trends of cervical cancer in Ethiopia. *Gynecology and Obstetrics (Sunnyvale)*. 2015; 5(103):2161-2932.
 23. World Health Organization. *Cancer country profiles 2014*. Geneva:World Health Organization; 2014.
 24. Federal Ministry of Health. *National cancer control plan, 2016-2020*. Ethiopia: Universal Printing Press; 2015.
 25. Azage M, Abeje G, Mekonnen A. Assessment of factors associated with breast self-examination among health extension workers in West Gogjam Zone, Northwest Ethiopia. *International Journal of Breast Cancer*. 2013; 2013:1-6.
 26. Tara S, Agrawal CS, Agrawal A. Validating breast self-examination as screening modalities for breast cancer in eastern region of Nepal: a population based study. *Kathmandu University Medical Journal*. 2008; 6(1):89-93.
 27. Addis Ababa City Administration Health Bureau. *Addis Ababa city administration 2008 E.C annual performance report*. Addis Ababa: Addis Ababa City Administration; 2015.
 28. Central Statistics Agency. *Population projection of Ethiopia for all regions at wereda level from 2014–2017*. Addis Ababa: Central Statistical Agency of Ethiopia; 2013. P. 118.
 29. Taranikanti M, Panda S, Dash A, Yasmeen N, Siddique A, Behara J. Knowledge of nurses about breast cancer risk factors, general awareness and screening procedures in South India. *Ultrasound*. 2014; 135:39-47.
 30. Oluwatosin O. Primary health care nurses' knowledge practice and client teaching of early detection measures of breast cancer in Ibadan. *BMC Nursing*. 2012; 11(1):22.
 31. Oluwole OC. Awareness, knowledge and practice of breast-self-examination amongst female health workers in a Nigerian community. *Sudan Journal of Medical Sciences*. 2008; 3(2):99-103.
 32. Teferi S, Mezgebe T, Demissie M, Durgaprasada A. Knowledge about breast cancer risk-factors, breast screening method and practice of breast screening among female healthcare professionals working in governmental hospitals, Addis Ababa, Ethiopia. *IOSR Journal of Pharmacy and Biological Sciences*. 2012; 2(1):5-12.
 33. Erdem Ö, Toktaş İ. Knowledge, attitudes, and behaviors about breast self-examination and mammography among female primary health care workers in Diyarbakır, Turkey. *BioMed Research International*. 2016; 2016:1-6.
 34. Segni MT, Tadesse DM, Amdemichael R, Demissie HF. Breast self-examination: knowledge, attitude, and practice among female health science students at Adama science and technology University, Ethiopia. *Gynecology and Obstetrics*. 2016; 6(368):2161-2932.
 35. Salma KJ, Wafaa AA, Haider T. Attitudes of nurses toward early detection of Breast Cancer at Teaching Hospitals in Hilla City/Iraq. *IOSR Journal of Nursing and Health Science*. 2016; 5(1):101-107.
 36. Raja Lexshimi RG, Zaleha MI, Wahida Daud MS,

- Syed Zulkifli SZ. Knowledge, attitude and practice of breast self-examination among nurses in Tertiary hospitals in Malaysia. *Malaysian Journal of Public Health Medicine*. 2014; 14(3):54-62.
37. Birhane K, Alemayehu M, Anawte B, Gebremariam G, Daniel R, Addis S, et al. Practices of breast self-examination and associated factors among female Debre Berhan University Students. *International Journal of Breast Cancer*. 2017; 2017:8026297.
38. Doumit MA, Fares S, Arevian M. Knowledge, practices, and attitudes of women toward breast cancer in Lebanon. *American Journal of Hematology/Oncology*. 2017; 13(7):21-28.
39. Kassa RT, Wakjira HT, Gebremariam MB, Abera Tullu S, Shehissa NK. Breast cancer knowledge and breast self-examination practice among female students in Rift Valley University, Adama campus, Adama, Ethiopia, 2017. *Journal of Women's Health Care*. 2017; 6:5.