# Breast Self-examination Practice among Female Health Extension Workers: A Cross Sectional Study in Wolaita Zone, Southern Ethiopia

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## Abstracts

**Background:** Early detection of breast cancer plays an important role in decreasing its morbidity and mortality. Health extension workers (HEWs) are the main actors to implement health extension packages and to provide primary healthcare services at community level in Ethiopia. Thus, if BSE is integrated with these packages, deaths from breast cancer can be averted by early detection and treatment. However, practice of the health extension workers on breast cancer and BSE is not known yet in Ethiopia. The study aimed to assess the Practice of Health extension workers on Breast Self-Examination and its associated factors in Wolayta Zone.

**Methods:** A cross-sectional study conducted at Wolayta zone from 05/15/2017 to 06/01/2017. Simple random sampling technique used having sampling frame of all health extension workers, in Wolayta. A total of 281 health extension worker participated in the study. Data entered into Epi-info version 3.4.3, and exported to SPSS version 21 for analysis. Among the candidates, independent variables with a P-value <0.05 entered in the final model and having a dependent variable classified into dichotomous, a binary logistic regression model done to identify predictors of BSE practice among respondents.

**Results:** Among a total of 281 HEW, 128 (45.6%) of respondents were ever practiced breast self-examination while the remaining 153 (54.4%) had never practiced BSE. HEW perceived BSE practice beneficiary had 3 times higher breast self-examination practice for AOR and 95% CI of [1.5-6.5]. HEW with "high" and "low" level of perception for breast cancer had higher breast self-examination practice for AOR and 95% CI of [(5.0(2.0-10.5), 3.0(2.8-8.0)] respectively. Respondents were 3 times more likely to practice breast self-examination when there was Support on BSE from spouse/partner for AOR and 95% CI of [1.5-8.75].

**Conclusions:** The prevalence of breast self-examination practice among HEW in Wolaita Zone was low implicating a great negative impact on early detection of breast cancer and breast problems. Moreover, giving training on the techniques of breast self-examination for health extension workers is the way of reaching the wider community and the best opportunity to tackle the problem at wider perspective.

**Keywords:** Breast self-examination practice; Health extension workers

**Abbreviations** AGHMC: Adama General Hospital and Medical Collage; BSE: Breast Self-Examination; CBE: Clinical Breast Examination; HEP: Health Extension Practice; HEW: Health Extension Worker; HP: Health Post; NCD: Non Communicable Disease; NGO: Non-Governmental Organization; PHC: Primary Health Care; PHCU: Primary Health Care Unit; SNNPR: South Nation Nationalities and Peoples Republic; UN: United Nation, WHO: World Health Organization; RHEW: Rural Health Extension Workers; UHEW: Urban Health Extension Workers; SD: Standard Deviation; ETB: Ethiopian Birr

## Background

Breast cancer is curable if detected early through screening and early diagnosis by breast self-examination (BSE), clinical breast examination (CBE), and mammography [1]. Early detection of breast cancer plays an important role in decreasing its morbidity and mortality. Breast self-examination (BSE) is one of the screening methods for early detection of breast cancer [2-4].

Globally, about 25 million people are living with cancer [5]. Recent estimates showed that cancer incidence will almost triple by 2030, with 20–26 million new cancer diagnoses and 13-17 million deaths [6]. Cancer is the second leading cause of death in the world. More than 70% of all cancer deaths occurred in low and middle-income countries [5,7]. Of all types of cancers, breast cancer is the most common cancer among women both in developing and developed countries [8,9]. It is the leading cause of death among women aged between 40 and 55 years [10]. Recent global cancer statistics indicated that breast cancer incidence is rising at a faster rate in populations of developing countries [11,12].

Africa is suffering the heavy burden of this serious public health crisis. A large proportion of cancers in Africa are diagnosed at an

advanced stage of the disease where curative treatment is no longer an option. This is due to the lack of screening and early detection services, as well as limited awareness of early signs and symptoms of cancer among the public and health care providers. Because many African countries lack adequate number of health facilities that can provide specialized treatment and palliative care, cancer patients are faced with long waiting period and considerable treatment costs that are beyond their economic means. The overwhelming demand for cancer treatment and care, the fragile public health system in many African nations coupled with the absences of national cancer control plan and supportive policy and financial frameworks is causing serious social and economic crises that call for an immediate and coordinated action to prevent and control cancer in Africa [13].

For developing countries like Ethiopia, with few experts and lack of advanced diagnostic techniques, promoting regular breast self-examination is the feasible option [14]. However, its practice is dependent on knowledge, attitude towards BSE practice among women [15-17]. Since more than 90% of cases of cancers of the breast are detected by women themselves, stressing the importance of breast Self–examination [16]. Health extension workers (HEWs) are the main actors to implement health extension packages and to provide primary healthcare services at community level in Ethiopia. Though, the current focus of Ethiopian Ministry of Health with regards to health extension worker is on controlling communicable diseases at the primary health care units, if BSE is integrated with these packages, deaths from breast cancer can be averted by early detection and treatment.

Despite the public health importance of breast cancer in Ethiopia, the study done in west Gojjam Zone showed of all HEWs, only 14.4% practiced BSE regularly (every month) and 147(37.3%) HEWs reported that they practiced BSE during their life time [18]. However, little is known on practice of BSE among HEWs in the study area.

Wolaiyta zone is located in southern Ethiopia, 380 km from Addis Ababa and 157 km from SNNPR State main city of Hawassa. According to the Wolayta zonal health department report, there are 878 HEWs. HEWs are trained and equipped with appropriate supplies to provide basic and essential promotive and preventive services, as well as selected curative services. The health extension package is expected to provide 15 packages. The services are grouped into four main themes: hygiene and environmental sanitation, family health care, prevention and control of communicable and non-communicable diseases, and injury prevention, control, first aid and referral linkages [18,19].

Early detection of breast cancer plays an important role in decreasing its morbidity and mortality. Breast self-examination (BSE) is one of the screening methods for early detection of breast cancer [2–4]. Breast cancer was reported the second out of the ten top cancers registered at Tikur Anbesa Radiotherapy center [10]. Most healthcare facilities in Ethiopia do not have advanced laboratory investigations for diagnosing breast cancer. In resource scarce countries like Ethiopia, BSE should be promoted for early detection of breast cancer to prevent related morbidities and mortalities.

Though little is known on activities for early detection of breast cancer through BSE by HEP, in 2011 the Heads of State and Government made a commitment in the Political Declaration at the High-Level Meeting of the UN General Assembly on the Prevention and Control of NCDs and achieving the WHO Voluntary Global Target of 25% relative reduction in risk of premature mortality from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases [20].

Although breast cancer is becoming the most crucial issue in Ethiopia, little is known on BSE practice of HEWs for early detection of breast cancer. There is no published research, which assessed extent of BSE practice of HEWs in the study area.

In resource scarce countries like Ethiopia, BSE should be promoted for early detection of breast cancer to prevent related morbidities and mortalities. Health extension workers (HEWs) are the main actors to implement health extension packages and to provide primary healthcare services at community level in Ethiopia. Thus, if BSE is integrated with these packages, deaths from breast cancer can be averted by early detection and treatment.

Identifying the factors affecting breast self-examination (BSE) for breast cancer is important in designing strategies to improve the knowledge and practice of breast self-examination in the community so that it is used as a primary method for screening breast cancer.

Therefore, this study is aimed to assess BSE and identify factors associated with BSE among HEWs. Moreover, findings from the study can provide information on BSE for governmental health officials and other nongovernmental organizations which are working on health particularly on cancer to raise awareness amongst women about breast cancer and the role of BSE in breast cancer prevention and control.

## Methods

### Study design, setting and population

Cross-sectional study design used to assess factors associated with breast self-examination practice among health extension workers in Wolayta zone from 05/15/2017 to 06/01/2017. Wolayta zone is located in southern Ethiopia, 380 km from Addis Ababa and 157 km from SNNPR State main city of Hawassa. The zone has 4471.3 km$^2$ which accounts 3.8% of the country. According to zonal health department report, there were a total of 878 HEWs. All health extension workers in Wolayta zone were source population whereas randomly selected health extension worker in Wolayta zone were study population. All on job female health extension workers of Wolayta zone during the study period were included in the study and Health Extension Workers who were seriously ill during the study period, who had mastectomy and known breast cancer, were excluded from the study.

### Study size and sampling procedure

The sample size was determined based on single population proportion formula by assuming the proportion of practicing breast self-examining health extension workers to be 37.3% obtained from previous study done at west Gojjam Zone Amhara Region [18], with 95% confidence level and 5% margin of error. Since N is less than 10,000, using correction formula: (Total number of HEWs in the Woliata zone [N] is 878), and considering 10% non-response rate, the total sample size became 281. Simple random sampling technique used. Having sampling frame of all health extension workers obtained from Zonal health Department, HEWs were randomly selected using a lottery method. Finally, randomly selected health extension workers were interviewed for the actual study.

## Data collection and measurements

Interviewer-administered structured questionnaire adopted from similar survey were used for data collection [18,21]. Trained 5 data collectors interviewed the participant and 2 supervisors oversee the data collection process. The questionnaire was developed by English language and was translated to Amharic to maintain consistency of the measurement. The first part of the questionnaire contains questions on socio-demographic and economic characteristics. While section two has, practice of BSE questions. Section three consists of questions assessing knowledge factors of study participants on Breast Self-Examination, section four on individual factors and section five consists of assessing questions on socio cultural. Breast self-examination Practice were assessed using a question have you ever practiced BSE for early detection of breast cancer and HEWs ever practiced breast self-examination for early detection of breast cancer were considered as the outcome.

The quality of data was assured by pre-testing of data collection tools (questionnaires) on 5% of health extension workers in Shone town before the initiation of the main study. The chance for information contamination and inclusion of the pre-tested participants at the final study will be minimal since they are located far apart. Training will also be given for one day by the principal investigator to data collectors and supervisors prior to data collection.

## Data analysis

After data collection, each questionnaire checked for completeness, then coded and entered into Epi info version 3.5.1 and exported to SPSS version 20 software package for analysis. Multiple logistic regressions was used to assess any association and strength of association between explanatory factors and outcome variables after adjusting for the effects of other variables. Odds ratio with 95% confidence interval was also used to measure the degree of association between independent and dependent variables. The results was presented in the form of tables, figures and text using frequencies and summary statistics such as mean, standard deviation and percentage to describe the study population in relation to relevant variables. Statistical significance will be declared at p-value less than 0.05. Finally, Efforts were made to assess whether the necessary assumptions for the application of multivariable logistic regression fulfilled. Independent variables with p value of <0.25 were candidates for binary logistic regressions. Among the candidates, independent variables with a P-value <0.05 will be entered in the final model. Having a dependent variable classified into dichotomous, a binary logistic regression model was done to identify predictors of BSE practice among respondents.

## Results

### Socio-demographic and economic characteristics

A total 281 HEW participated in this study giving a response rate of 100%. Among 281 HEW, 41(14.6%), 240 (85.4%) were urban and rural for their residence respectively. Majority of respondents (83.3%) were married, while 45(16%), 2(0.7%) never married and divorced respectively. One hundred eight respondents (70.5%), 44(15.7%), 39(13.9%) were RHEW, UHEW and level IV HEW for their job status respectively. The mean age [SD] of respondents were 27.5 [4] years with a maximum of 39 years and a minimum of 19 years old. The mean [SD] number of children for respondents was 2 children with a maximum of 6 children's. The majority 238(84.7%) had monthly income >2000 ETB and the remaining 43(15.3%) had monthly income ≤ 2000 ETB. Socio-demographic and economic characteristics indicated in Table 1.

| Variables | Frequency | Percententage (%) |
|---|---|---|
| **Age** | | |
| 19-24 | 62 | 22.1 |
| 25-29 | 142 | 50.5 |
| 30-34 | 48 | 17.1 |
| 35-39 | 29 | 10.3 |
| **Religion** | | |
| Orthodox | 32 | 11.4 |
| Protestant | 236 | 84 |
| Catholic | 2 | 0.7 |
| Muslim | 11 | 3.9 |
| Others | 32 | 11.4 |
| **Child number** | | |
| 1-2 children | 126 | 44.8 |
| 3 children | 32 | 11.4 |
| 4 and above childrens | 21 | 7.5 |

| | | |
|---|---|---|
| none | 102 | 36.3 |
| **Mother education** | | |
| no formal education | 112 | 39.9 |
| primary | 104 | 37 |
| secondary | 23 | 8.2 |
| >12 | 42 | 14.9 |
| **Father education** | | |
| no formal education | 78 | 27.8 |
| primary | 88 | 31.3 |
| secondary | 56 | 19.9 |
| >12 | 59 | 21 |

**Table 1:** Socio-demographic and economic characteristics of HEW in Wolaita Zone, 2017 (N=281).

## Prevalence of breast self-examination practice

Among a total of 281 HEW, 128(45.6%) of respondents were ever practiced breast self-examination while the remaining 153(54.4%) had never practiced breast self-examination.

Among 128(45.6%) who had ever practiced BSE, 46(36%) HEW practiced breast self-examination any time I observe a change and 66(52.8) practiced breast self-examination for <6 times in the past 1 year. Summary of BSE practice indicated in the Table 2.

| Variables | Frequency | Percentage (%) |
|---|---|---|
| **Frequency of BSE Practice** | | |
| Twice per month | 23 | 18 |
| Once Every month | 18 | 14.1 |
| Once Every 6 month | 20 | 15.6 |
| Once per year | 21 | 16.4 |
| Any time I observe a change | 46 | 36 |
| **Frequency of BSE Practice in the past 1 year** | | |
| <6 times | 66 | 52.8 |
| 6-11 times | 30 | 24 |
| >12 times | 29 | 23.2 |
| **Respondents used opposite arm for BSE** | | |
| yes | 93 | 73.8 |
| no | 33 | 26.2 |
| **Respondents used any arm for BSE** | | |
| yes | 33 | 27 |
| no | 87 | 71.3 |

**Table 2:** Breast self- examination practice of HEW in Wolaita Zone, 2017 (N=281).

## Knowledge on breast self-examination practice

Respondents who had ever practiced BSE were asked for 6 steps used to determine the proficiency and knowledge of the breast self-examination technique with an assumption of a score of zero indicates that the respondent is unable to describe anything she did, while a score of six indicates that the respondent mentioned performing all steps necessary for complete breast self-examination. Among all respondent ever practiced BSE only 8(6.3%) mentioned performing all steps necessary for complete breast self-examination indicated in Table 3.

| Variables | Frequency | Percentage (%) |
|---|---|---|
| Knowledge proficiency score on BSE practice | | |
| 0 | 8 | 6.3 |
| 1 | 16 | 12.5 |
| 2 | 40 | 31.3 |
| 3 | 33 | 25.8 |
| 4 | 19 | 14.8 |
| 5 | 4 | 3.1 |
| 6 | 8 | 6.3 |

**Table 3:** Knowledge proficiency score on BSE practice of HEW in Wolaita Zone, 2017.

## Predictors of breast self-examination practice

For further analysis, all independent covariates which fulfilled the minimum requirement for multivariable logistic regression (had significant association at a p<0.25) were entered. Six independent variables not fulfilled the minimum requirement excluded from further analysis of multivariable logistic regression. Independent variables excluded from further analysis were, child number, knowledge on cause of breast cancer, knowledge on treatment of breast cancer, knowledge on screening of breast cancer, knowledge on breast infection, family history of breast cancer, support on breast self-examination from spouse. The backward stepwise regression that controls the problem of multicollinearity employed. Multiple logistic regression analysis revealed eight independent predictors of breast self-examination practice for health extension workers

Among socio-demographic and economic factors included in the study, there was statistically significant association of breast self-examination practice of HEW with age and job status. HEW with a job status of RHEW and UHEW had lower breast self-examination practice compared to level-IV HEW at adjusted OR and 95% CI [0.15(0.05-0.5), 0.21(0.05-0.84)] respectively.

Breast self-examination practice had statistically significant difference for current age of respondents in the study area. Younger women in age category of 19-24 years, 25-29 years and 30-34 years age had lower breast self-examination when compared to HEW in age category of 34-39 years old for AOR and 95% CI [0.022(0.004-0.104), 0.065(0.017-0.248), 0.070(0.015-0.328)] respectively.

Among perception factors included in the study, there was statistically significant association of breast self-examination practice of HEW with perceived benefit of BSE and perceived level of risk for breast cancer. HEW perceived BSE practice beneficiary had 3 times higher breast self-examination practice for AOR and 95%CI of [1.5-6.5] when compared to HEW perceived BSE practice not beneficiary.

Respondents BSE practice was higher when perceived level of risk for breast cancer is increasing. HEW with "high" and "low" level of perception for breast cancer had higher breast self-examination practice for AOR and 95% CI of [5.0(2.0-10.5), 3.0(2.8-8.0)] respectively, when compared to those who "don't know" their level of risk for breast cancer, respectively. However, there was no statistically significant association of breast self-examination practice of HEW perceived as "not at risk" for breast cancer compared to those who "don't know" their level of risk for breast cancer.

Among predictors of BSE practice, previous history of mammography had statistically significant association with breast self-examination practice of HEW. Respondents who ever done mammography had 4 times higher breast self-examination practice for AOR and 95% CI of [3.0-10.6].

There was statistically significant difference on breast self-examination practice of HEW who had Support on BSE from spouse/partner. Respondents were 3.0 times more likely to practice breast self-examination when there was Support on BSE from spouse/partner for AOR and 95% CI of [1.5-8.75], compared to those who had no Support on BSE practice from spouse/partner.

Among knowledge factors included, there was statistically significant association with breast self-examination practice of HEW for respondent's knowledge on breast cancer risk factors and breast cancer prevention. HEW were more likely to practice BSE when they able to mention at least one breast cancer risk factors and able to mention at least one breast cancer prevention mechanisms. HEW who mentioned at least one breast cancer risk factors had 4.0 times higher breast self-examination practice for AOR and 95% CI of [2.0-8.4], when compared to those HEW mentioned none. Similarly, HEW who mentioned at least one breast cancer prevention mechanisms had 4.0 times higher breast self-examination practice for AOR and 95% CI of [1.6-10.5], when compared to those HEW mentioned none. Multivariable logistic regression-showing predictors of breast self-examination practice indicated in Table 4.

| Variables | BSE practice | | AOR, 95% CI | P-value |
|---|---|---|---|---|
| | Yes | No | | |
| **Age** | | | | 0 |
| 19-24 | 18(14.1) | 44(28.8) | 0.02(0.004-0.10) | 0 |
| 25-29 | 61(47.7) | 81(52.9) | 0.07(0.02-0.25) | 0 |
| 30-34 | 25(19.5) | 23(15) | 0.07(0.02-0.33) | 0.001 |
| 35-39 | 24(18.8) | 5(3.3) | 1 | |
| **Job status** | | | | 0.004 |
| RHEW | 82(64.1) | 116(75.8) | 0.15(0.05-0.5) | 0.001 |
| UHEW | 23(18) | 21(13.7) | 0.21(0.05-0.84) | 0.028 |
| LEVEL-IV HEW | 23(18) | 16(10.5) | 1 | |
| **Perceived benefit on BSE practice** | | | | |
| yes | 98(76.6) | 74(48.4) | 3.0(1.5-6.5) | 0.008 |
| no | 30(23.4) | 79(51.6) | 1 | |
| **History of mammography** | | | | |
| Yes | 95(74.2) | 59(38.6) | 4.0(3.0-10.6) | 0 |
| No | 33(25.8) | 94(61.4) | 1 | |
| **Perceived risk level of breast cancer** | | | | 0 |
| Not at risk | 22(17.2) | 28(18.3) | 1.0(0.4-2.5) | 0.999 |
| At low risk | 34(26.6) | 23(15.0) | 5.0(2.0-10.5) | 0.001 |
| At high risk | 38(29.7) | 12(7.8) | 3.0(2.8-8.0) | 0 |
| I don't know | 34(26.6) | 90(58.8) | 1 | |
| **Support on BSE from spouse/partner** | | | | |
| Yes | 51(39.8) | 16(10.5) | 3.0(1.5-8.75) | 0.007 |
| No | 77(60.2) | 137(89.5) | 1 | |
| **Knowledge on breast cancer RF** | | | | |
| Yes | 104(81.2) | 63(41.2) | 4.0(2.0-8.4) | 0.001 |
| no | 24(18.2) | 90(58.8) | 1 | |
| **Knowledge on breast cancer prevention** | | | | |
| Yes | 30(23.4) | 55(35.9) | 4.0(1.6-10.5) | 0.004 |
| no | 98(76.6) | 98(64.1) | 1 | |

**Table 4:** Multivariable logistic regression-showing predictors of breast self-examination practice of HEW, Wolaita Zone, 2017.

## Discussions

Early detection of breast cancer plays an important role in decreasing its morbidity and mortality. Breast self-examination (BSE) is one of the screening methods for early detection of breast cancer [2-4]. BSE should be promoted for early detection of breast cancer to prevent morbidities and mortalities. Health extension workers (HEWs) are the main actors to implement health extension packages and to provide primary healthcare services at community level in Ethiopia. Thus, in resource scarce countries like Ethiopia, if BSE is integrated with these packages, deaths from breast cancer can be averted by early detection and treatment.

This study assessed the prevalence and predictors of breast self-examination practice of HEW in Wolaita Zone by incorporating socio-demographic and economic, individual, family, knowledge on BSE, knowledge on breast cancer and perception factors.

The study showed low prevalence of breast self-examination practice among HEW in Wolaita Zone implicating a great negative impact on early detection of breast cancer and breast problems. The prevalence of breast self-examination practice for HEW in Wolaita Zone was 45.6% while the remaining 54.4% had never practiced breast self-examination. Slight different finding with this study was reported from the research done on HEW in west Gojjam Zone, Norther Ethiopia, where 37.3% HEWs reported that they practiced BSE during their life time [18]. The difference may be due to socio demographic difference between respondents. The finding was also consistent with the study conducted in Malaysian women teachers where, only 54% had never performed BSE [22]. The similar finding may be due low awareness on breast cancer and low perceived level susceptibility for breast cancer.

Age plays a significant role in breast cancer morbidity and mortality among women. This is because there is a decrease in the average age of the women diagnosed with breast cancer and there is increase in the life time risk of breast cancer among women.

This study indicated younger women had lower breast self-examination when compared to HEW in age category of 34-39 years. This finding concurs with the findings of Iranian, India, Jordan, in Kuwait, in Iraq and among women in the eastern part of Nigeria, who reported that women who practiced BSE were older than women who did not practice BSE [23-27]. This similar finding may be due to elderly women may be aware that age is a significant factor of breast cancer and may perceive the role of BSE in the early diagnosis of breast cancer as relevant.

Among perception factors included in the study, there was statistically significant association of breast self-examination practice of HEW with perceived benefit of BSE and perceived level of risk for breast cancer. HEW perceived BSE practice beneficiary had higher breast self-examination practice when compared to HEW perceived BSE practice not beneficiary. The study among female teachers in Ethiopia reported perceived benefit towards breast cancer, the odds of performing BSE increased [28]. The study conducted among Women Living in Samsun indicated respondents perceived BSE benefits were performed BSE at higher rates. This similar finding may be due to socio cultural and demographic factors of respondents.

Respondents BSE practice was higher when perceived level of risk for breast cancer is increasing. HEW with "high" and "low" level of perception for breast cancer had higher breast self-examination practice when compared to those who "don't know" their level of risk for breast cancer. The study among female teachers in Ethiopia reported that per a unit increases in total score of perceived susceptibility towards breast cancer the odds of performing BSE increased. Similar finding from the study conducted among Women Living in Samsun reported as women who have higher susceptibility to breast cancer performed BSE at higher rates [28,29]. This similar finding may be due to educational status of respondents.

The association between BSE performance and ever having a mammogram supports the idea of combining different breast cancer screening methods when designing the programs of breast cancer mass screening and education. Among predictors of BSE practice, previous history of mammography had statistically significant association with breast self-examination practice of HEW.

Respondents who ever done mammography had higher breast self-examination practice when compared their counterpart. Similar finding was reported from the study conducted among Health Extension Workers in West Gojjam Zone, Northwest Ethiopia indicated those HEWs who examined their breast by health professional were more likely to practice BSE than their counter parts [18] This similar finding may be due to prior dissemination of information by health providers on benefit and BSE for early detection of breast cancer.

There was statistically significant difference on breast self-examination practice of HEW who had Support on BSE from spouse/partner. Respondents were more likely to practice breast self-examination when there was Support on BSE from spouse/partner compared to those who had no Support on BSE practice from spouse/partner. The finding was consistent with the study conducted among Health Extension Workers in West Gojjam Zone, Northwest Ethiopia where those HEWs who had discussion with families on the importance of BSE more likely to practice BSE than those HEWs who had no discussion with someone on the importance of BSE. The study conducted among Women Living in Samsun indicated similar finding with this study where low BSE perceived barrier performed BSE at higher rates. The finding was also similar with the study conducted among Iranian where perceived barrier had negative direct and indirect effects on BSE [18,26,29]. This similar finding may be due to socio cultural and demographic factors of respondents.

Among knowledge factors included, there was statistically significant association with breast self-examination practice of HEW for respondent's knowledge on breast cancer risk factors and breast cancer prevention. HEW was more likely to practice BSE when they able to mention at least one breast cancer risk factors and able to mention at least one breast cancer prevention mechanisms, when compared to those HEW mentioned none respectively. The finding of this study is consistent with the study conducted in Malaysian women teachers indicated where Women with higher levels of knowledge about breast cancer symptoms and screening demonstrated higher performance rates of BSE. Also the study conducted in tertiary hospitals of Indian among rural women indicated similar finding where the odds ratio of having insufficient knowledge about breast cancer was higher in women who never practiced BSE [22,25]. This similar finding may be due to media exposure and prior dissemination of information by health providers on benefit and BSE for early detection of breast cancer.

## Conclusions

- Health extension workers as educators need to teach all females attending various health care settings about the importance of BSE in early detection of breast cancer. However, prevalence of breast self-examination practice among HEW in Wolaita Zone was low implicating a great negative impact on early detection of breast cancer and breast problems.
- The majority of respondents don't know how to do BSE practice.
- There were gaps between HEW's knowledge and their practices of BSE.
- Statistically significant difference on BSE practice among HEW in Wolaita Zone was seen by age, Perceived benefit on BSE practice, History of mammography, Perceived risk level of breast cancer, Support on BSE from spouse/partner, Knowledge on breast cancer risk factor, Knowledge on breast cancer prevention.

## Declarations

### Ethics approval and consent to participate

The study obtained ethical approval from Ethical review committee of Adama General Hospital and Medical College. Verbal consent was obtained from each study participants. Identification of study participants by name was avoided to assure the confidentiality of the information obtained.

### Consent for publication

Not applicable.

### Availability of data and materials

Data supporting the findings of this study is presented in the manuscript. Furthermore, raw data will be available from the corresponding author on reasonable request.

### Competing interests

The authors declare that they have no competing interests.

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Not Applicable.

### Authors' contributions

MA conceived the study and was involved in the design, coordination, field supervision, data analysis, report writing and drafted the manuscript. HB involved in proposal preparation and report writing. AA involved in the proposal preparation, data analysis and drafted the manuscript. All authors read and approved the manuscript.

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