

# Breast Self-Examination Practice and Associated Factors Among Women Attending Family Planning Service in Modjo Public Health Facilities Southwest Ethiopia

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**Purpose:** Breast cancer is the leading cause of cancer death worldwide and the second common cancer overall. Breast self-examination is one of the cheapest methods used for the early detection of breast cancer in asymptomatic women. However, the practice of breast self-examination remains low in Ethiopia. Therefore, this study aimed to assess breast self-examination practice and associated factors among women attending family planning services in Modjo public health facilities in southwest Ethiopia.

**Patient and Methods:** Facility-based cross-sectional study was conducted in Modjo public health facilities from October 01, 2020, to October 30, 2020. Data were collected from 420 women by using an interviewer-administered structured questionnaire. Variables with a P-value  $\leq 0.2$  in the bivariate analysis were included in the multivariable logistic regression model. Results of regression analysis were shown as odds ratio (OR) and confidence intervals (95% CI).

**Results:** Overall 86 (20.5%) of the participants had ever performed breast self-examination. The odds of breast self-examination practice among women with tertiary level of education were 2.14 [AOR: 2.14; 95% CI: (1.45, 6.74)] times higher compared to those with secondary education. Women who knew breast self-examination were 4.32 [AOR: 4.32; 95% CI: (1.81, 10.81)] times higher odds of breast self-examination practice compared to their counterparts. The odds of breast self-examination practice among women who had a positive attitude were 2.7 [AOR: 2.7; 95% CI: (1.03, 6.91)] times higher compared to women with a negative attitude towards breast self-examination.

**Conclusion:** Breast self-examination practice was low within the study area. Tertiary level of education, having Knowledge on breast self-examination and a positive attitude towards breast self-examination were found to have a significant association with breast self-examination practice. Breast self-examination should be promoted by improving awareness and providing special health education for women that had low educational level.

**Keywords:** breast cancer, breast self-examination, practice, associated factors

## Introduction

Globally in 2020, there have been 2.3 million women diagnosed with carcinoma and 685,000 deaths. As of the end of 2020, 7.8 million women alive were diagnosed with breast cancer in the past 5 years, making it the world's most prevalent cancer. Age-standardized breast cancer mortality in high-income

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countries dropped by 40% between the 1980s and 2020.<sup>1</sup> In Sub-Saharan Africa, breast cancer is the second leading cause of death and most commonly diagnosed cancer in women with an age-adjusted incidence rate of 28 per 100,000 women.<sup>2,3</sup> It is estimated that 10,000 Ethiopian women have breast cancer with a thousand cases being unreported and becoming fatal due to late presentation, limited resources, and strong traditional beliefs delaying medical care.<sup>3-5</sup>

Although a lot of investment of government of Ethiopia in the health sector, communicable and infectious diseases are still the major health issues in the country. Cancer, particularly breast cancer, is on the bottom of the priority lists. That is why there is no such infrastructure and facilities to fight against breast cancer.<sup>6</sup>

Breast cancer occurs in every country of the world in women at any age after puberty but with increasing rates in later life. In contrast to this breast cancer occur in Ethiopia at a younger age, more than 50% occurred at premenopausal, aged <40 years with stage 3 disease.<sup>7</sup>

According to the American Cancer Society (ACS), the three important screening methods recommended for early detection of breast cancer are Breast Self-examination (BSE), Clinical breast examination (CBE), and mammography.<sup>8</sup> Mammography cannot be routinely used in resource low countries like Ethiopia due to limited health service resources, requires trained professionals and technology, and mostly due to its expensiveness. Clinical breast examination (CBE) is also dependent on professional skills and requires a health facility visit.<sup>3</sup>

Unlike clinical breast examination and mammography, (BSE) allows women to perform breast examinations independently without being dependent on health care professionals. BSE remains recommended as a general approach to increase breast health awareness allowing for early detection of abnormalities.<sup>3</sup>

BSE practice is a cost-effective method to make women familiar with the appearance and feel of their breasts for early detection of cancer.<sup>9,10</sup> In the United States, about 75% of women conduct BSE with an adequate quality rating of 27%<sup>11</sup> while an Australian study reported that about 31% of women examined their breasts thoroughly.<sup>12</sup> On the contrary, BSE practice was very low in countries like Saudi Arabia and Iran where only 18.7% and 4.5% of women practiced BSE.<sup>9,10</sup> A practice of BSE in Pakistan was 24.9%.<sup>13</sup>

In Sub Saharan Africa, a study conducted among Nigerian women showed that only 18.1% of women practiced while a study in Ghana found BSE practice to be only 32%.<sup>14,15</sup>

Studies conducted in different regions of Ethiopia revealed performance rates of BSE that varied between 6.5% and 39.4% among adult women.<sup>3,5,16-26</sup> Despite its prevalence, reproductive organ cancers (ROC) are not addressed as major public health problems at any level of the health care system. Nationwide, there is no organized ROC prevention, education, screening, or curative care program.<sup>27</sup> Moreover, limited studies are conducted regarding BSE practice among women. The finding of this study will provide information to the concerned bodies (governmental and non-governmental organizations) to plan important interventions to improve women's practice of BSE. Therefore, this study aimed to assess BSE practice and associated factors among women attending Family planning services in Modjo public health facilities in southwest Ethiopia.

## Methods and Materials

### Study Design, Subjects, and Setting

The institution-based cross-sectional study design was conducted on women attending family planning service in Modjo town public health facilities from October 01/2020–October 30/2020. Modjo is found in East Showa Zone, Oromia Regional State, and is located 74 km south-east of Addis Ababa. According to the town health office, the total population is estimated to be 71,652 of which 34,220 are men, 37,432 are women, and 17,348 childbearing age (15–49) women. The city has one public and one private hospital and two public health centers and fifteen private health facilities (Mojo town health office; six months evaluation report of health and health related activities of Mojo town health facilities; unpublished data; 2020).<sup>28</sup>

### Sample Size and Sampling Procedure

The required sample size was calculated by using single population proportion formula with an assumption of 95% confidence interval (CI), 5% margin of error, the proportion of breast self-examination practice among women taken from a study in Mekelle town, northern Ethiopia.<sup>29</sup> Therefore, using the formula single

population;  $n = (z^2 * p * q) / d^2$  proportion,  $z = 1.96$  with 95% of confidence interval,  $q = 1 - p$ ,  $d =$  margin of error tolerated (0.05)  $n =$  the required sample size,  $p =$  proportion of breast self-examination practice among women (53.6%). The sample size calculated was 382.

Finally, the largest sample size was found to be 382 from the first objective and by adding a 10% non-response rate, the final sample size was 420. All women aged 20–49 attended family planning service in Modjo public health facilities during the study period were included in the study. Women who were diagnosed with breast cancer were excluded.

All the public health facilities found in Modjo Town (Modjo hospital, Modjo health center, and Hachaltu health center) were included in the study. The sample size was proportionally allocated for the public health facilities depending on the last six months of women's client flow for family planning service. The public health institutions had seen a total of 4073 female clients in the last 6 months for family planning services (Modjo hospital 1230, Modjo Health center 1940, Hachaltu health center 903).

Study participants were selected by systematic random sampling, sampling interval was calculated by dividing the average monthly client flow of facilities by the sample size, and every two women were selected on exit from family planning service.

## Data Collection Procedures

A structured interviewer-administered questionnaire was prepared by reviewing similar articles. The questionnaire was prepared in English language, then translated to local language and translated back to English to maintain its consistency. Three diploma clinical nurse data collectors and one BSc in public health supervisor were assigned. The data collectors had relatively similar working experience in cancer clinics. They were also had experience in data collection on an equivalent issue in other areas of the country. The training was given for two days on the way of interviewing and filling the questionnaire. The questionnaire consists of five parts, which are socio-demographic factors, knowledge about breast self-examination, attitude towards breast self-examination and family history of breast cancer, and breast self-examination practice. Data collectors directed questions for women while they exited from the service.

## Quality Control Measures

Data quality was controlled via conducting a pre-test on 5% of the sample size before actual data collection with the nearby area public health facility, Adama Dembele health center, to ensure that the respondents can able understand the wording, skip the order of the questions sensibly. Findings from pretesting of the questionnaires were part of the training and the concerns identified were clarified. The correction of the questionnaire was done after pre-testing. The training was given to data collectors and supervisors. The completeness of the questionnaire was also checked before data entry. Data were edited, cleaned, coded, and entered into the SPSS version 25.1.

## Data Analysis Technique

The collected data were coded and entered into Epi-info version 7.2 and then was exported to SPSS version 25.0 for analysis. Descriptive statistics were done by computing summary statistics like frequency, mean, percentages, and standard deviations, and the results were presented in tables and graphs. Binary logistic regression was done to assess the crude relationship between the independent variables and the dependent variable. All variables having a  $P \leq$  of 0.2 were considered as a candidate for multivariable logistic regression to control for possible confounding effects. Multivariable logistic regression was applied to see the independent effect of each variable on the outcome variable. Multicollinearity among the independent variables was checked using VIF and Hosmer and Lemeshow test was used to assess models Goodness of fit. Final results of association were presented based on adjusted Odds Ratio at 95% confidence level and  $p < 0.05$  was considered statistically significant.

## Study Variables

The dependent variable was BSE practice. The independent variables were Socio-demographic factors (age, marital status, educational level, and employment), knowledge, attitude, history of Breast cancer and Breast disease: Family history of breast cancer, personal history of breast disease, and familiarity with other people who have breast cancer.

## Operational Definition Knowledgeable on BSE

Knowledge was measured by the total number of correct answers to eight questions on knowledge related to BSE practice. Participants who scored median and above the value of the provided eight questions were categorized as knowledgeable while those who scored below the median value were considered not knowledgeable.<sup>14</sup>

## Positive Attitude Towards BSE

Based on the Likert scale the statements assessing attitude, women with above the median of the distribution were considered as having a positive attitude towards BSE.<sup>19</sup> BSE practicing position: In this study, correct BSE practicing positions are on standing in front of a mirror or lying down position.<sup>30</sup> BSE practicing technique: In this study, correct BSE practicing techniques is the inspection of the breast in front of the mirror, palpation of the breasts with the pads of the fingers in a circular motion, or squeezing the tip of breasts for discharge.<sup>30,31</sup> Ever practiced BSE: practicing BSE at least once before. Frequency /regular BSE practice: the practice of BSE monthly.<sup>30</sup> Timing of BSE: the practice of BSE 2–3 days after menses.<sup>32</sup>

## Ethical Approval and Consent to Participant

Adama Hospital Medical College of Health Science and Medicine, Health Research Institutional Ethics Review Board approved the study and ethical clearance was obtained from this office on the behalf of the first author (Meron Urga Workineh). The study was conducted per the Declaration of Helsinki. A written letter was given to each health institution from the Mojo administration health office. The respondents were informed about the aim of the study, and written consent was obtained from the study subjects.

## Result

### Socio-Demographic Characteristics of Respondents

A total of 420 participants were included in the study with a response rate of 100%. The mean age of participants was 29 (SD±7.2) years. More than half 225 (53.6%) of the participants were aged 20–29. Regarding the marital and education status of the participants, 329 (78.3%) were

**Table 1** Sociodemographic Characteristics of Women Attending Family Planning in Modjo Town, Oromia Regional State, Ethiopia, 2020

| Variable (n=420)   | Category                               | Frequency | Percent |
|--------------------|--|-----------|---------|
| Age                | 20–29                                  | 225       | 53.6    |
|                    | 30–39                                  | 133       | 31.6    |
|                    | 40–49                                  | 62        | 14.8    |
| Marital status     | Single                                 | 54        | 12.9    |
|                    | Married                                | 329       | 78.3    |
|                    | Divorced                               | 27        | 6.4     |
|                    | Widowed                                | 10        | 2.4     |
| Educational status | No formal education                    | 54        | 12.9    |
|                    | Primary education (grade 1–8)          | 152       | 36.2    |
|                    | Secondary education (grade 9–12)       | 122       | 29.0    |
|                    | Tertiary education (diploma and above) | 92        | 21.9    |
| Employment status  | Student                                | 24        | 5.7     |
|                    | Housewife                              | 202       | 48.1    |
|                    | Government employed                    | 72        | 17.1    |
|                    | Self-employed                          | 51        | 12.1    |
|                    | Private employed                       | 71        | 17.0    |

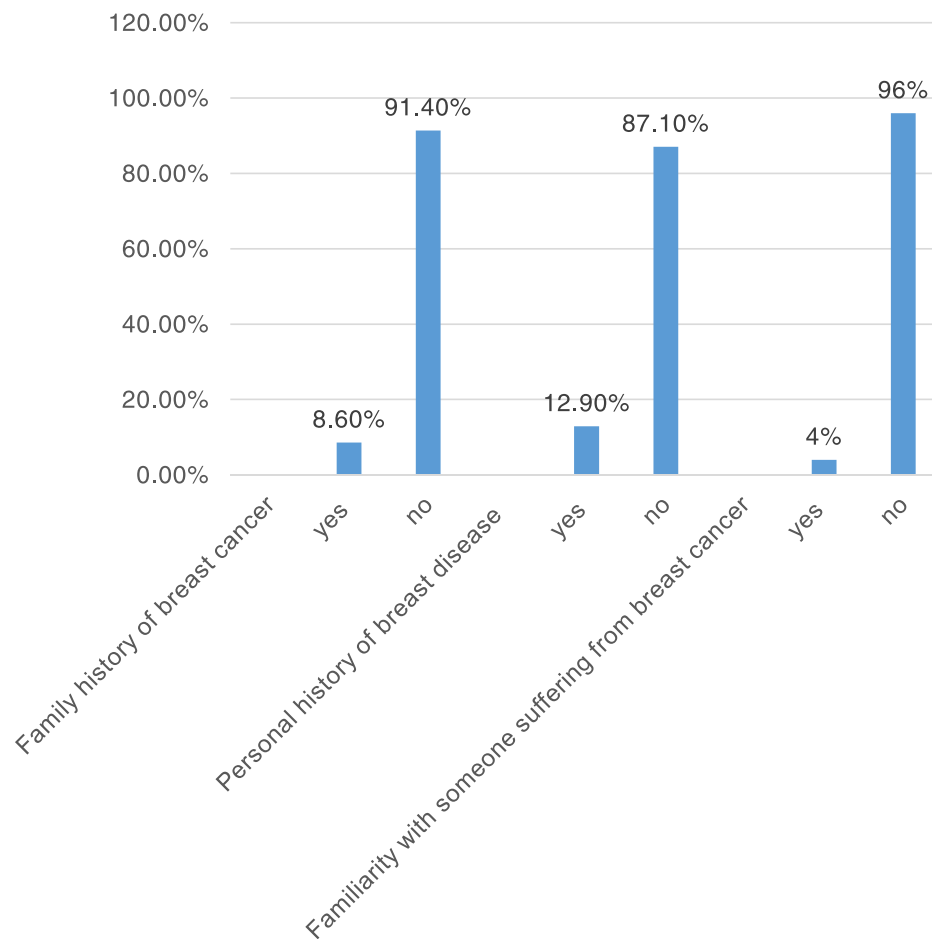
married and 152 (36.2%) attended primary education and 122 (29%) attended secondary education respectively (Table 1).

### Family History of Breast Cancer and Personal History of Breast Disease of Respondents

Of the participants, 36 (8.6%) had a family history of breast cancer while 54 (12.9%) had a personal history of breast disease. Around 403 (96%) did not have familiarity with someone suffering from breast cancer (Figure 1).

### Knowledge About BSE Practice of Respondents

Concerning knowledge, eight knowledge-related items were used for assessing knowledge about BSE. Reliability analysis was done and Cronbach's alpha was 0.755, which means there were consistencies between items. About 126 (30%) scored median value and above



**Figure 1** Family and personal history of breast disease among women attending public health facilities in Modjo town, Ethiopia, 2020.

were considered knowledgeable on BSE. Participants that have ever heard about BSE were 296 (70.5%). Their predominant source of information was mass media 178 (60.1%) (Table 2).

### Attitude Towards Breast Self-Examination

There were eight attitude-related items concerning attitude towards BSE with Likert scale of responses (1–5 value). The median and the mean were 34 and 33.85 respectively.

About 283 (67.4%) scored median and above values and had a positive attitude toward BSE while 32.6% had a negative attitude towards BSE (Figure 2).

### BSE Practice of Respondents

Among the 420 participants 86 (20.5%) ( $P=20.5\%$ ; 95% CI: 16.7, 24.5) of the participants had ever performed BSE while 11 (12.8%) practiced regularly. The

major reason for performing BSE was for early detection and treatment of breast cancer 39 (45.3%) (Table 3). The major reason that they do not practice BSE was they do not know how to examine their breast (Figure 3).

### Factors Associated with BSE Practice of Respondents

A binary logistic regression analysis was done to identify factors associated with BSE practice. In bivariate logistic regression analysis variables; age between 30 and 39, government employment, educational status of secondary and tertiary level, family history of breast cancer, personal history of breast disease, being knowledgeable about BSE, and positive attitude towards BSE were statistically significant (at  $P\text{-value} \leq 0.2$ ).

In multivariable logistics regression, tertiary-level educational status, knowledge about BSE, and Positive

**Table 2** Knowledge of BSE Among Women Attending Public Health Facilities in Modjo Town, Ethiopia, 2020

| Variables                                | Category  | Frequency | Percent |
|--|---|-----------|---------|
| Ever heard about breast self-examination | Yes   | 296       | 70.5    |
|  | No  | 124       | 29.5    |
| Source of information                    | Mass media  | 178       | 60.1    |
|  | Health professionals  | 95        | 32.1    |
|  | Friends/ relatives/ neighbors                                   | 23        | 7.8     |
| Age to start BSE                         | At age less than20  | 72        | 24.3    |
|  | At Age 20   | 108       | 36.5    |
|  | At age 30   | 94        | 31.7    |
|  | I do not know   | 22        | 7.5     |
| Frequency BSE should be performed        | Monthly   | 131       | 44.2    |
|  | Every 3 month   | 96        | 32.4    |
|  | Other   | 69        | 23.4    |
| Time to perform BSE                      | Few days before menses  | 83        | 28      |
|  | 2–3 days after menses   | 112       | 37.8    |
|  | Anytime During menses   | 91        | 30.7    |
|  | I do not know   | 10        | 3.5     |
| Body position to perform BSE             | Standing in front of the mirror                                 | 186       | 62.8    |
|  | Lying down  | 79        | 26.7    |
|  | I do not know   | 9         | 3.1     |
|  | Other   | 22        | 7.4     |
| Benefit of BSE                           | To become familiar with how your breasts normally look and feel | 57        | 19.3    |
|  | To identify changes you see or feel in your breasts             | 75        | 25.3    |
|  | I do not know   | 164       | 55.4    |
| Technique to perform BSE                 | Inspecting the breast in front of the mirror                    | 65        | 21.9    |
|  | Palpating using the finger pads in circular motion              | 77        | 26      |
|  | Squeezing the tip of the nipple for Discharge                   | 82        | 27.7    |
|  | I do not know   | 72        | 24.4    |

(Continued)

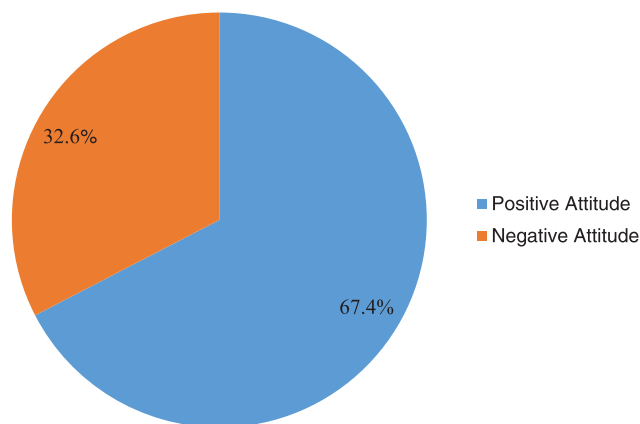
**Table 2** (Continued).

| Variables   | Category               | Frequency | Percent |
|---|------------------------|-----------|---------|
| Signs of breast cancer when BSE performed                               | Breast lump            | 43        | 14.5    |
|   | Swelling of the breast | 28        | 9.5     |
|   | Bloody Discharge       | 69        | 23.3    |
|   | I do not know          | 156       | 52.7    |
| Do you think finding changes in your breasts does mean there is cancer? | Yes                    | 213       | 72      |
|   | No                     | 83        | 28      |

attitude towards BSE were found to be significantly associated with BSE practice (at p-value <0.05). The odds of BSE practice among women with tertiary level of education were 2.14 [AOR: 2.14; 95% CI: (1.45, 6.74)] times higher compared to those with secondary education. Women who were knowledgeable about BSE were 4.32 [AOR: 4.32; 95% CI: (1.81, 10.81)] times higher odds of BSE practice compared to their counterparts. The odds of BSE practice among women who had a positive attitude towards BSE were 2.7 [AOR: 2.7; 95% CI: (1.03, 6.91)] times higher compared to women with a negative attitude towards BSE (Table 4).

### Discussion

BSE is an easy, safe, and convenient method of screening for breast cancer. In this study, it was found that 86 (20.5%) of



**Figure 2** Attitude towards breast self-examination practice among women attending public health facilities in Modjo town, Ethiopia, 2020.

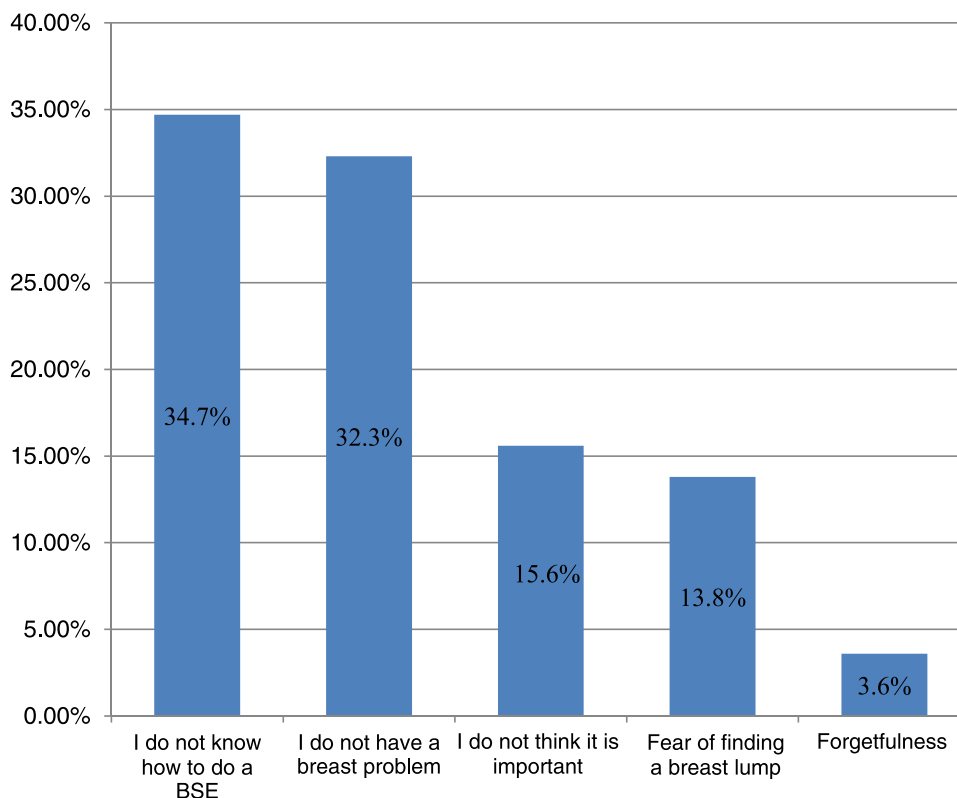
**Table 3** BSE Practice Among Women Attending Public Health Facilities in Modjo Town, Ethiopia, 2020

| Variable   | Option  | Frequency | Percent |
|--|---|-----------|---------|
| Ever performed BSE   | Yes   | 86        | 20.5    |
|  | No  | 334       | 79.5    |
| Reasons to perform (n=86)  | For early detection and treatment of breast cancer                                  | 39        | 45.3    |
|  | Fear of developing breast cancer  | 33        | 38.4    |
|  | Recommended by professionals  | 14        | 16.3    |
| Age when you started performing BSE(n=86)  | < 20 years  | 21        | 24.4    |
|  | At 20 years   | 13        | 15.1    |
|  | At 30 years   | 30        | 34.9    |
|  | At 35years  | 22        | 25.6    |
| Frequency of performing BSE (n=86)   | Monthly   | 11        | 12.8    |
|  | Every 6 month   | 51        | 59.3    |
|  | Annually  | 24        | 27.9    |
| Time of performing BSE (n=86)  | Few days before menses  | 31        | 36.0    |
|  | 2–3 days after menses   | 15        | 17.4    |
|  | Anytime during menses   | 40        | 46.5    |
| The body position used while performing BSE  | Standing in front of a mirror   | 44        | 51      |
|  | Lying down  | 42        | 49      |
| BSE techniques used while performing BSE   | Inspection of the breast in front of a mirror                                       | 34        | 39.5    |
|  | Palpation of the breasts with the pads of the 3 middle fingers in a circular motion | 23        | 26.7    |
|  | Squeezing the tip of the nipples for discharge                                      | 29        | 33.8    |
| Used the right hand to palpate the left breast and the left hand to palpate the right breast | Yes   | 22        | 25.6    |
|  | No  | 64        | 74.4    |
| Signs of breast cancer checked during BSE  | Breast lump   | 25        | 29.1    |
|  | Swelling of the breast  | 15        | 17.4    |
|  | Bloody discharge  | 19        | 22.1    |
|  | Change in color and shape of the breast skin  | 27        | 31.4    |

women had ever practiced BSE. This finding was higher than a study done in Adwa among women of 20–70 years attending public health facilities, Nigeria among female traders, Egypt among newly diagnosed BC patients, Saudi Arabia.<sup>3,10,14,33</sup> The difference may be the difference in the study participants and the difference in sociodemographic factors. Because the study participants in Egypt were women who were newly diagnosed breast cancer patients, this may underestimate the retrospective history of BSE. Concerning study participants in Nigeria and Saudi Arabia, there was a difference in the level of education ie 51% of the study participant in Saudi Arabia and 24.2% in Nigeria were illiterate whereas 87.1% of our study participants were above the primary level of education. As most studies showed, as the level of education is high, there will be a tendency to BSE practice. On the contrary, this study result is lower than

studies conducted in Jimma University, Wolaita Sodo town, Debre Birhan University, Dire Dawa, Addis Ababa University, Gamo Gofa Zone, Western Ethiopia, Addis Ababa city, Northern Ethiopia, Wolaita zone, Debre Tabor, Adama University, West Shoa Zone, south India, Kuwait, Malaysia, Pakistan.<sup>5,13,16–19,21–25,29,34–38</sup> The difference in this study can be explained by the difference in the study participants. The participants within the above-mentioned studies were university students and health extension workers, which could have a far better understanding of the importance of breast self-examination than participants of this study could.

Regarding the frequency of conducting BSE only 12.8% of the study participants conducted BSE regularly. This result was lower than the studies conducted in Western Shoa Zone, Addis Ababa, Wolaita Sodo town, Debre Tabor, Addis



**Figure 3** Reasons for not practicing breast self-examination among women attending public health facilities in Modjo town, Ethiopia, 2020.

Ababa University, Gamo Gofa Zone, Western Ethiopia.<sup>6,18,19,23–25,35</sup> the difference in this study can be explained by the difference in the study participants. The participants within the above-mentioned studies were university students and health extension workers, which could have a far better understanding of the importance of breast self-examination than participants of this study could. On contrary, this result was higher from the study conducted in Adwa, Nigeria, Adama University.<sup>3,5,14</sup> The difference may be the difference in the study participants and the difference in sociodemographic factors (level of education).

Regarding the timing of BSE practice, 17% of the participants practiced BSE 2–3 days after menses. This is almost similar to the study conducted in Nigeria.<sup>14</sup> However, this result was lower from the study conducted in the Philippines.<sup>30</sup> This could be due to the different educational backgrounds and study areas of the participants. The study was also higher than the study conducted in Adwa.<sup>3</sup> This could be due to the difference in the time of study period since there could be better awareness in the current study period.

Regarding the positions of practicing BSE 51% practiced in standing position and 49% practiced in lying down

position. This is almost similar to the study conducted in the Philippines both standing and lying position but was lower than the study conducted in Poland.<sup>30,32</sup>

Regarding the techniques of practicing BSE, in this study, 39.5%, 26.7%, and 33.8% of the study participants used inspection of the breast in front of a mirror, palpation of the breasts with the pads of the three middle fingers in a circular motion and squeezing the tip of the breasts for discharge. This is much lower than the study conducted in Kuwait with 54.1%, 55%, and 79.8%.<sup>37</sup> This could be the difference in the level of education ie, 86.5% of the study participant were above the secondary level of education which could have a better understanding of the importance of BSE than participants of this study.

This study also revealed that only 29.9% of the study participants used their right hand to palpate the left breast and vice versa. The finding was very low than the study conducted in Kuwait which was 76.1%.<sup>37</sup> This could be the difference in the level of education ie, 86.5% of the study participant were above the secondary level of education which could have a better understanding of the importance of BSE and the techniques than participants of this study.



**Table 4** Factors Associated with BSE Practice Among Women Attending Public Health Facilities in Modjo Town, Ethiopia, 2020

| Variables                                 | BSE Practice |     | COR with 95% CI   | AOR with 95% CI   | p-value |
|---|--------------|-----|-------------------|-------------------|---------|
|   | Yes          | No  |                   |                   |         |
| <b>Age</b>                                |              |     |                   |                   |         |
| 20–29                                     | 34           | 191 | 0.67(0.32, 1.36)  | 2.18(0.84, 5.69)  |         |
| 30–39                                     | 39           | 94  | 1.56(1.16, 3.20)  | 0.45(0.12, 1.58)  |         |
| 40–49                                     | 13           | 49  |                   |                   |         |
| <b>Employment status</b>                  |              |     |                   |                   |         |
| Housewife                                 | 12           | 190 |                   |                   |         |
| Student                                   | 11           | 13  | 0.14(0.04, 3.41)  | 0.30(0.52, 1.77)  |         |
| Private employed                          | 22           | 49  | 0.12(0.10, 2.61)  | 0.61(0.17, 2.19)  |         |
| Government employed                       | 28           | 44  | 0.06(0.02, 0.72)  | 1.10(0.12, 1.76)  |         |
| Self employed                             | 13           | 38  | 0.14(0.12, 1.41)  | 0.47(0.24, 4.94)  |         |
| <b>Educational status</b>                 |              |     |                   |                   |         |
| Primary education and below(1–8)          | 6            | 200 |                   |                   |         |
| Secondary education (9–12)                | 20           | 102 | 0.15(0.12, 0.60)  | 0.39(0.13, 1.14)  | 0.087   |
| Tertiary education(diploma and above)     | 60           | 32  | 0.02(0.01, 0.73)  | 2.14(1.45, 6.74)  | 0.000** |
| <b>Family history of breast cancer</b>    |              |     |                   |                   |         |
| Yes                                       | 19           | 17  | 5.28(2.61, 10.70) | 1.10(0.24, 2.81)  |         |
| No  | 67           | 317 |                   |                   |         |
| <b>Personal history of breast disease</b> |              |     |                   |                   |         |
| Yes                                       | 18           | 36  | 2.19(1.74, 4.09)  | 2.11(0.59, 7.54)  |         |
| No  | 68           | 298 |                   |                   |         |
| <b>Knowledge</b>                          |              |     |                   |                   |         |
| Knowledgeable                             | 60           | 66  | 9.37(2.45, 17.02) | 4.32(1.81, 10.81) | 0.000** |
| Not knowledgeable                         | 26           | 268 |                   |                   |         |
| <b>Attitude</b>                           |              |     |                   |                   |         |
| Positive attitude                         | 70           | 213 | 2.48(1.38, 4.47)  | 2.7(1.03, 6.91)   | 0.043*  |
| Negative attitude                         | 16           | 121 |                   |                   |         |

**Notes:** \*Shows statistically significant at  $p < 0.05$ , \*\*Shows statistically significant at  $p < 0.001$ .

**Abbreviations:** AOR, adjusted odds ratio; COR, crude odds ratio.

Regarding the factors associated with BSE practice being knowledgeable on BSE, having a positive attitude towards BSE and tertiary level education were found to have a significant association with BSE practice. It was found that women with a tertiary level of education were 2.14 times more likely to practice BSE than women with secondary education. This finding was similar to the study conducted among women attending public facilities in Addis Ababa, West Shoa Zone, Dire Dawa, Western Ethiopia, Adama University, Northern Ethiopia, Nigeria, and Malaysia.<sup>5,6,14,16,19,23,29,38</sup> This may be women with higher education may have more exposure to health

information and more knowledge about breast cancer which in turn may influence their intention to BSE practice.

In this study, women who were knowledgeable about BSE were 4.32 times more likely to practice BSE than their counterparts. This is consistent with the studies conducted in Nigeria, among women attending public facilities and urban health extension workers in Addis Ababa, among health care workers in Debre Tabor, West Shoa Zone, Debre Birhan University, University of Gondar, Dire Dawa, Addis Ababa University, Gamo Gofa Zone, Western Ethiopia, Malaysia, and Iran.<sup>6,9,14,16–20,23–26,38</sup>

This is due to knowledgeable respondents' motivation to practice breast self-examination.

The study showed that women who had a positive attitude towards BSE were 2.7 times more likely to practice BSE than women with a negative attitude towards BSE. This was similar to the study conducted in Debre Birhan University, Dire Dawa, Addis Ababa University, Western Ethiopia, and Malaysia.<sup>16–19,38</sup> this may be due to having a positive attitude that can create a favorable environment to develop intention towards BSE that leads to its practice.

## Conclusion

BSE practice was found to be low within the study area. Tertiary level of education, having Knowledge on BSE and a positive attitude towards BSE was found to have a significant association with BSE practice. BSE should be promoted by improving awareness and providing special health education for women that had low educational level.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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## Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors declare that they have no conflicts of interest for this work.

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