

# Intention to Undergo Clinical Breast Examination and Its Associated Factors among Women Attending Rural Primary Healthcare Facilities in South Central Ethiopia

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## Keywords

Breast cancer · Clinical breast examination · Breast cancer screening

## Abstract

**Background:** Breast cancer is a global public health problem with higher mortality in developing countries. The Ethiopian National Cancer Control Plan recommends clinical breast examination (CBE) for all women aged >18 years. However, there is low breast examination practice in Ethiopia. Therefore, this study aimed to describe level of intention to undergo CBE and associated factors among women visited selected rural healthcare facilities in south central Ethiopia using Theory of Planned Behavior (TPB). **Methods:** This study used facility-based cross-sectional study design. A total of 420 women participated in this study. Interviewer-administered structured questionnaire was adopted from previously published research works and Ajzen's TPB manual. Statistical Package for Social Sciences (SPSS), version 27, was used for analysis. Binary logistic regression model was used to determine factors associated with intention to undergo CBE. **Results:** In this study, nine out of ten women had never had CBE. Mean score for intention to undergo CBE was 12.55 (SD ± 3.22; min 5, max 20). Intention to undergo CBE was negatively associated with being in the second and middle wealth quantiles compared to the highest wealth quantile, and with the spouse not being able to read or write compared to having attended formal education. Positive attitude and

higher subjective norm had relevant association with intention to undergo CBE. **Conclusion:** The high score for intention to undergo CBE should encourage primary healthcare facilities to offer CBE. Behavioral change communication interventions could address women's attitude, subjective norm, and spouse's education associated with intention to undergo CBE.

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## Introduction

Breast cancer is a global public health problem, representing one in four cancers diagnosed among women. There were an estimated 2.3 million new cases and 684,996 deaths from breast cancer worldwide in 2020 [1]. Breast cancer mortality is higher in developing countries, whereas incidence is greatest in developed countries [2]. In Ethiopia, breast cancer is the leading cancer type, accounting for 20.9% of new cancer diagnoses and 17.5% of cancer deaths in the country in 2020 [1]. Similarly, according to the Addis Ababa population-based cancer registry report, breast cancer is the most frequently diagnosed malignant tumor, accounting for 31.5% of cancer cases in women [3].

The global breast cancer initiative highlighted timely diagnosis of breast cancer to improve the survival rate [4]. Ethiopia developed the National Cancer Control Plan in 2016 to improve the early diagnosis of cancer. The plan

indicated, all women aged >18 years coming to health institutions for any health complaints are expected to undergo clinical breast examination (CBE). According to the plan, healthcare professionals (nurses, health officers, and doctors) at primary, secondary, and tertiary health facilities should offer CBE. However, the time interval for taking CBE is not revealed in the plan [5].

Despite having the CBE service available at all levels of health facilities for asymptomatic women in Ethiopia, different studies in the country showed low breast examination practice [6–8] and diagnosis at an advanced stage of the disease [9, 10]. Advanced-stage diagnosis may lead to an unsatisfactory treatment outcome because it needs to involve multiple treatment modalities, including surgery, radiotherapy, and chemotherapy, and there is only one radiotherapy center (Addis Ababa, Tikur Anbessa Hospital) in the country [9].

According to the qualitative study conducted in south and southwestern Ethiopia, patient-related barriers to early diagnosis of breast cancer were lack of knowledge and awareness of breast cancer, belief in traditional medicine and religious practices for treatment, and lack of social and financial support to seek care at a medical facility, and health system-related barriers were misdiagnosis of breast cancer, long distance to referral facilities, high cost of diagnostic services, long waiting time for diagnostic tests, and lack of screening and diagnostic tests in local facilities [11]. Thus, determining women's intention to undergo CBE and its associated factors will be an evidence base for designing interventions to increase the practice of early breast cancer detection, thereby increasing early diagnosis and improving the survival rate.

This study used the *Theory of Planned Behavior* (TPB). According to the TPB, an individual's attitude, subjective norm, and perceived behavioral control determine an individual's intention to undergo a particular behavior [12]. The TPB has been applied in a wide variety of health behaviors, such as in cervical cancer screening [13–15]. However, to our knowledge, studies that focus on intention to undergo CBE have not been carried out in this study area. Thus, there is an information gap among study subjects, stakeholders, and policymakers. This study therefore aims to determine the intention to undergo CBE and its associated factors among women attending primary healthcare facilities (PHFs) in south and southwest Ethiopia using the TPB.

## Methods

### *Study Design, Area, and Period*

This study employed a health facility-based cross-sectional study design in 12 health centers in south central Ethiopia. Selection of health centers was based on the formative assessment

findings on CBE service availability. These health centers were found in the Southwest Shewa zone of the Oromia region and the Gurage zone of the Southern Nations, Nationalities, and Peoples' Region (SNNPR) of Ethiopia. Data were collected from 10 October to 10 November 2020.

### *Study Population*

All women aged >18 years who visited the selected PHFs during the time of data collection were eligible for this study. However, women with confirmed breast cancer were excluded.

### *Sample Size Determination*

Sample size was determined according to the formula for estimation of a single population proportion, using OpenEpi software version 2.3. We followed the assumptions of a 1.96 critical value at 95% confidence interval (CI) of certainty, a 5% (0.05) margin of tolerated sampling error, a 50% probability (*P*) of intention toward CBE (there is no similar prior study) and a 10% nonresponse rate. The sample size was determined to be 422.

### *Sampling Procedures*

A systematic random sampling technique was used to select actual study participants from the 12 PHFs. Ten days before actual data collection, the client's flow rate to each of the 12 PHFs was calculated, and no difference in the flow rate for the next 10 days of the data collection period was assumed. An average flow rate of 60 adults per day was calculated for each PHF, as observed during the preceding period. From the Ethiopian Demographic Health Survey 2019, there is a 1:1 male-to-female ratio in the general population [16]. Thus, we expected a flow rate of 30 adult females per day for the actual 10 days of data collection. The total sample size was proportionally allocated between 12 PHFs ( $422/12 = 36$ ). Thus, 36 women over 10 days of data collection amounts to four women per day for each facility. The sample size interval (*K*th value) is computed as  $30/4 = 8$ . Therefore, every other eighth adult woman visiting each of the PHFs was approached and interviewed at exit from the PHF.

### *Measurements and Data Collection*

A structured, interviewer-administered questionnaire was used to collect the information. To measure the TPB constructs, an elicitation study was conducted using 16 in-depth interviews with participants like the target population to explore locally available salient behavioral, normative, and control beliefs toward CBE. In measuring TPB constructs, a total of twelve themes have emerged from the in-depth interviews. Themes emerged in measuring behavioral beliefs toward CBE are CBE detects breast cancer at early stage, CBE is painful, CBE has side effect/s, and CBE invades privacy. Themes emerged in measuring normative beliefs toward CBE are my husband/partner would approve CBE, my father/mother would approve CBE, other community members would approve CBE, and healthcare professionals would approve CBE. Themes emerged in measuring perceived behavioral control beliefs toward CBE are I don't think I am at risk of acquiring breast cancer, CBE is expensive, CBE service is not easily available, and fear of positive result after CBE (online Suppl. material 1; for all online suppl. material, see <https://doi.org/10.1159/000531944>).

Thereafter, a structured questionnaire was prepared according to Ajzen's TPB manual [12]. Other sections of the questionnaire were adapted from previously published studies [6, 17] on breast cancer awareness and CBE practice studies in Ethiopia, with minor changes to fit the objectives of this study and the local context.

The structured questionnaire was developed in the English language, translated into local languages (Amharic and Afan Oromo) and then back translated into English to maintain consistency in

meaning and sense by language experts. The first draft questionnaire was pilot tested and appropriate modifications were made. The final version of the questionnaire was structured into 10 sections: intention, both direct and indirect attitude, subjective norm and perceived behavioral control, past CBE practice, sociodemographic characteristics, and knowledge. Intention and direct TPB constructs (attitude, subjective norm, and perceived behavioral control) were each measured with four items on a five-point Likert scale. Responses ranged from 'strongly disagree' (1) to 'strongly agree' (5) for items measuring the TPB constructs, with responses ranging from "very unlikely" (1) to "very likely" (5) for items measuring intention. According to Ajzen's TPB manual [12], the items used to measure direct attitude toward CBE were CBE is beneficial, CBE is good, undertaking CBE feels pleasant, and CBE is important. Items used to measure direct subjective norm toward CBE were most of those who are important to me think that I should take CBE, I am not feeling under social pressure to take CBE, people who are important to me want me to take CBE, and it is expected of me to take CBE. Items used to measure direct perceived behavioral control toward CBE were I am confident that I could take CBE, for me taking CBE is easy, the decision to take CBE is under my control and whether I take CBE or not is entirely up to me. Items used to measure intention in the coming 6 months were how likely is it that you will think to take CBE, how likely is it that you will need CBE services, how likely is it that you will look for and request CBE services, and how likely is it that you will take CBE?

Each of the intention item scores was summed and gave observed values ranging from 5 to 20. The mean intention score was calculated and was used to dichotomize the intention variable. Respondents who answered above the mean were considered to be intended to undertake CBE. Each of the direct perceived behavioral control item scores, direct subject norm item scores, and direct attitude item scores were separately summed and gave observed values of 4–20, 4–20, and 5–20, respectively. All the direct TPB constructs were treated as continuous variables.

The data were collected by trained data collectors using an online data collection kit (ODK). During the data collection time, data collectors repeat same question twice and keep both responses whenever they observe any internal or external condition that might affect respondents' ability to respond accurately. Thus, during the data cleaning, correlations were calculated between the two sets of responses for test-retest reliability check, and all interclass correlation (ICC) results were above 0.894. Lowest ICC (0.894) was for one direct attitude item scores, and highest ICC (0.94) was for one of the intention item scores.

All negatively stated items were reversed before analysis. Analysis of the items related to direct TPB constructs was conducted to establish internal consistency. A Cronbach's alpha value of  $>0.7$  confirmed the internal consistency of the dimension: 0.802 for direct attitude, 0.765 for direct subjective norm, and 0.789 for direct perceived behavioral control. Simple bivariate correlations between direct and indirect measures of the same TPB construct were made to confirm the validity of the measures. The TPB constructs (attitude, subjective norm, and perceived behavioral control) were treated as continuous variables. The intention variable was dichotomized using a mean split between intending and not intending to undergo CBE [12].

Normality of the data, homogeneity of variance, and multicollinearity were checked before running any kind of analysis. The existence of multicollinearity between each of the TPB constructs was checked and there was no multicollinearity among them (variance inflation factor  $<10$ ).

### Data Processing and Analysis

The responses in the completed ODK were exported to the Statistical Package for the Social Sciences (SPSS, version 27) for analysis. Descriptive statistics were used to describe frequency distribution, proportion, measures of central tendency, and dispersion. A series of independent sample *t* tests were used to determine whether mean differences existed for attitude, subjective norm, and perceived behavioral control toward CBE between women who are and are not intending to undergo CBE.

A binary logistic regression model was used to determine factors associated with intention to undergo CBE. Based on a *p* value of  $<0.25$  in bivariate analysis [18], consideration of multicollinearity, clinical significance, and the maximum number of variables considered reasonable to enter into the model, 12 variables were included in the multivariable logistic regression analysis. Statistical significance for the multivariable logistic regression analysis was set at  $p \leq 0.05$ . The Hosmer and Lemeshow goodness-of-fit tests showed that  $p = 0.298$ , which confirmed the model's adequacy to fit the data in this study.

## Results

### Sociodemographic Characteristics of Study Participants

From a total of 422 women identified as eligible for this study, 420 responded to the survey question, giving a 99.5% response rate. Close to half (194; 46.2%) of the participants were below the age of 35 years. Most of the participants, 175 (41.7%), were followers of the Orthodox religion. The majority (300; 71.4%) were married and 159 (37.9%) were multiparous. One-third of the participants (158; 37.6%) did not read or write and 217 (51.7%) were unemployed/student. Among the spouses of the 300 (71.4%) married respondents, 144 (48.0%) attended formal education and 179 (59.7%) were farmers (Table 1).

### Knowledge about Breast Cancer and Past CBE Practice

Among the 420 study participants, 263 (62.6%) said that breast cancer is noncommunicable. The majority of 298 (71%) mentioned pain in the breast as a breast cancer sign and symptom. Absence of breast-feeding and obesity were recognized as major risk factors for developing breast cancer by 288 (68.6%) and 269 (64%) of participants, respectively. Likewise, 297 (70.7%) and 271 (64.5%), respectively, gave breast-feeding and physical activity as breast cancer prevention measures. Only 185 (44%) of the respondents put CBE as breast cancer prevention method. In addition, each of the knowledge item scores were summed and gave observed values ranging from 6 to 22. The mean knowledge score is computed as 14.73 (SD  $\pm$  3.19), with 209 (49.8%) respondents answering above the mean (Table 2).

Few of the study participants (55; 13.1%) had ever undergone CBE. Among those who had, most of them (35; 63.6%) underwent CBE because of a health professional's recommendation (Table 2).

**Table 1.** Sociodemographic characteristics of study participants

Variable	Frequency (n = 420)	Percentage
<b>Age</b>		
<35 years	194	46.2
35–49 years	172	41.0
≥50 years	54	12.8
<b>Educational status</b>		
Could not read or write	158	37.6
Could read and write but no formal education	71	16.9
Attended formal education	191	45.5
<b>Occupational status</b>		
Government/non-government/self-employed	203	48.3
Unemployed/student	217	51.7
<b>Religion</b>		
Orthodox	173	41.2
Muslim	129	30.7
Protestant/Catholic	118	28.1
<b>Parity</b>		
0 (nullipara)	71	16.9
1	36	8.6
2–4 (multipara)	159	37.9
>4 (grand multipara)	154	36.7
<b>Marital status</b>		
Married/living together	300	71.4
Divorced/separated	21	5.0
Widowed	35	8.3
Never married/never lived together	64	15.2
<b>Spouse's educational status (n = 300)</b>		
Could not read or write	83	27.7
Could read and write but no formal education	73	24.3
Attended formal education	144	48.0
<b>Spouse's occupational status (n = 300)</b>		
Government/non-government employee	62	20.7
Self-employed	52	17.3
Farmer	179	59.7
Unemployed	7	2.3

### *Intention to Undergo CBE*

The mean intention score was calculated as 12.55 (SD ± 3.22) and 192 (45.7%) of the respondents considered to be intended to undergo CBE. There was a significant difference between women who intended and women who did not intend to take CBE in terms of their attitude, subjective norm, and perceived behavioral control. Women who intended to take CBE had a significantly favorable attitude ( $t = 19.363$ ;  $p < 0.001$ ), higher subjective norm ( $t = 12.044$ ;  $p < 0.001$ ), and higher perceived behavioral control ( $t = 7.271, 836$ ;  $p < 0.001$ ) than women who did not intend to take CBE (Table 3).

### *Factors Associated with Intention to Undergo CBE*

In the bivariable logistic regression analysis, 12 variables were included with the outcome variable. In the multivariable logistic regression analysis, among the

sociodemographic variables, the participant's wealth index and spouse's educational status had a statistically significant association with intention to undergo CBE. Among the TPB constructs, attitude and subjective norm had a statistically significant association with intention to undergo CBE.

The adjusted odds ratio (AOR) of intention to undergo CBE among the second wealth quantile is 70% lower than in the highest wealth quantile (AOR = 0.265; 95% CI: 0.085–0.828). The AOR of intention to undergo CBE among the middle wealth quantile is 80% lower than for the highest wealth quantile (AOR = 0.154; 95% CI = 0.039–0.602). The AOR of intention to undergo CBE among women whose spouse could not read or write is 80% lower than for women whose spouse attended formal education (AOR = 0.170; 95% CI = 0.036–0.797). In addition, per unit increase in the attitude score, the AOR

**Table 2.** Knowledge about breast cancer and past CBE practice

Variable	Frequency (n = 420)	Percentage
Breast cancer is a noncommunicable disease		
No	24	5.7
Yes	263	62.6
Do not know	133	31.7
Signs and symptoms		
Pain in the breast	298	71.0
Change in breast size	289	68.8
Change in breast shape	283	67.4
Swelling in the armpit	280	66.7
Discoloration of the breast	254	60.5
Nipple discharge	253	60.2
Dimpling of the breast	249	59.3
Itching	228	54.3
Risk factors		
Not breast-feeding	288	68.6
Obesity	269	64.0
Alcoholism	259	61.7
Late menopause	255	60.7
Positive family history	237	56.4
Early menarche	230	54.8
Smoking	200	47.6
Preventive measures		
Breast-feeding	297	70.7
Being physically active	271	64.5
Avoiding exposure to radiation	271	64.5
Controlling weight	270	64.3
Breast self-examination	269	64.0
Limiting hormonal therapy dose	267	63.6
Not smoking	254	60.5
Limiting alcohol	229	54.5
CBE	185	44.0
CBE practice		
Ever had CBE	55	13.1
Never had CBE	365	86.9
Reasons for having CBE (n = 55)		
Health professional's recommendation	35	63.6
Relative/friend's recommendation	4	7.3
Standard of care at the clinic	10	18.2
Television, radio, magazine, brochure	6	10.9

**Table 3.** The TPB constructs among women intending and not intending to undergo CBE

Sr. no.	TPB construct	Intending to undergo CBE		Not intending to undergo CBE		t	p value	95% CI
		mean	SD	mean	SD			
1	Attitude	15.1823	2.03197	11.1754	2.17817	19.363	<0.001	3.600096–4.413610
2	Subjective norm	14.0938	2.48167	11.0526	2.65603	12.044082	<0.001	2.544792–3.537444
3	Perceived behavioral control	14.5729	2.95426	12.2193	3.57243	7.271836	<0.001	1.717410–2.989827

**Table 4.** Factors associated with intention to undergo CBE

Variable	Intention		COR (95% CI)	P	AOR (95% CI)	p value
	yes (n)	no (n)				
Age						
<35 years	97	97	1.250 (0.862–2.292)	0.471	0.329 (0.086–1.254)	0.103
35–49 years	101	71	0.879 (0.474–1.628)	0.681	0.321 (0.096–1.078)	0.066
≥50 years	30	24	Ref		Ref	
Wealth index						
Lowest	43	41	0.679 (0.368–1.252)	0.215	0.553 (0.169–1.807)	0.327
Second	39	45	0.561 (0.304–1.035)	0.064	0.265 (0.085–0.828)	0.022*
Middle	26	58	0.290 (0.153–0.548)	0.001	0.154 (0.039–0.602)	0.007*
Fourth	33	51	0.419 (0.225–0.778)	0.006	0.552 (0.173–1.756)	0.314
Highest	51	33	Ref		Ref	
Educational status						
Could not read or write	63	95	0.670 (0.437–1.027)	0.066	1.662 (0.356–7.767)	0.518
Could read and write but no formal education	34	37	0.929 (0.538–1.602)	0.790	1.193 (0.316–4.504)	0.795
Attended formal education	95	96	Ref		Ref	
Occupational status						
Govt./non-govt./self-employed	105	98	1.601 (1.088–2.357)	0.017	1.982 (0.859–4.568)	0.109
Unemployed/student	87	130	Ref		Ref	
Religion						
Orthodox	59	114	0.500 (0.310–0.807)	0.005	1.092 (0.434–2.749)	0.852
Muslim	73	56	1.260 (0.763–2.081)	0.366	2.898 (0.985–8.522)	0.053
Protestant/Catholic	60	58	Ref		Ref	
Spouse's educational status						
Could not read or write	27	56	0.357 (0.203–0.628)	0.001	0.170 (0.036–0.797)	0.025*
Could read and write but no formal education	35	41	0.633 (0.363–1.104)	0.107	0.338 (0.096–1.191)	0.092
Attended formal education	85	63	Ref		Ref	
Knowledge						
Poor	95	116	0.946 (0.644–1.388)	0.775	0.972 (0.427–2.211)	
Good	97	112	Ref		Ref	0.946
CBE						
Never undertake CBE	166	199	0.930 (0.527–1.642)	0.803	1.215 (0.366–4.038)	
Ever undertake CBE	26	29	Ref		Ref	0.750
Attitude per unit increase <sup>a</sup>			2.589 (2.154–3.111)	0.001	2.636 (2.013–3.451)	0.001*
Subjective norm per unit increase <sup>a</sup>			1.587 (1.436–1.754)	0.001	1.418 (1.166–1.724)	0.001*
Perceived behavioral control per unit increase <sup>a</sup>			1.244 (1.165–1.329)	0.001	1.087 (0.945–1.251)	0.242

COR, crude odds ratio; AOR, adjusted odds ratio. \*Significant at  $p < 0.05$ . <sup>a</sup>Continuous variable.

of intention to undergo CBE increased 2.6-fold (AOR = 2.636; 95% CI = 2.013–3.451). The AOR of intention to undergo CBE increased 1.4-fold per unit increase in the subjective norm score (AOR = 1.418; 95% CI = 1.166–1.724) (Table 4).

## Discussion

In this study, the mean score of intention to undergo CBE was 12.55 (SD ± 3.22), with minimum and maximum values of 5 and 20, respectively. In Ethiopia, even though there are no studies yet that focus on intention to undergo breast screening, there are some studies on

intention to undergo cervical cancer screening. However, the mean score for intention to undergo CBE in our study was a little lower than the mean score of intention to undergo cervical cancer screening (14.52; SD = 4.012) in a study conducted in the Gomma district, Jimma, Ethiopia [15]. This might be due to the greater attention and effort given to cervical cancer screening than CBE in Ethiopia: for example, the availability of separate national cervical cancer prevention and control guidelines; cervical cancer being included in the national Health Management Information System (HMIS) for reporting; and CBE and cervical cancer screening being given together in a “cervical cancer screening” room at PHFs in Ethiopia.

Our study showed that the odds of intention to undergo CBE among women whose spouse could not read or write are 80% lower than for women whose spouse attended formal education (AOR = 0.155; 95% CI = 0.033–0.722). Likewise, Indian males who had completed secondary education were more likely to have a positive intention to support their wife's screening than males who had not completed secondary education [19]. This is in line with the WHO recommendation for male education to increase their willingness to encourage and support their partners in screening programs [20]. A study conducted in Addis Ababa, Ethiopia, also revealed that women who attended secondary and tertiary school were two and four times more likely to practice breast cancer screening (AOR = 2.46, 95% CI = 1.12–5.38; AOR = 4.00, 95% CI = 1.48–10.86), respectively, when compared to participants who did not attend formal education [6]. This could indicate that education in general is an important factor in breast cancer screening. That is why, the Millennium Development Goals [21] and the Sustainable Development Goals [22] prioritize universal primary education as a foundation to improving people's lives.

The present study showed that the odds of intention to undergo CBE increased by 2.6-fold per unit increase in the attitude score (AOR = 2.621; 95% CI = 2.005–3.426) and increased by 1.4-fold per unit increase in the subjective norm score (AOR = 1.399; 95% CI = 1.154–1.696). Likewise, according to a study carried out in Nepal, women with a positive attitude, high subjective norm, and high perceived behavioral control were more likely to have intention to undergo CBE [23]. Perceived behavioral control and subjective norms also demonstrated a significant association with intention to undergo breast cancer screening in a study conducted in European countries [24]. This indicates that TPB constructs (attitude, subjective norm, and perceived behavioral control) should be emphasized when developing interventions to increase CBE or breast cancer screening. The reason for not having a significant relationship between perceived behavioral control and intention to CBE in this study while other studies mentioned above showed that could be due to the sociodemographic variations between this study and the above studies, as the above studies are in Europe and Asia.

This study revealed that 13.1% (95% CI = 10–16) of women ever had CBE. Similarly, a systematic review conducted on studies in sub-Saharan Africa showed that the lifetime prevalence of CBE ranged from 2% among rural women in Nigeria to 28.9% among nurses in Lagos, Nigeria [25]. Even though our results fall in the range of the findings from different studies, any differences might be due to the difference in sociodemographic characteristics and population segment (e.g., nurses in Lagos). The practice of CBE in this study (13.1%) is higher than for a similar study in urban settings of the SNNPR in Ethiopia (6.1%) [8]. However, this variation might be because the current study assessed women who had ever

undergone CBE, but the SNNPR study assessed regular engagement in CBE practice. Additionally, it must be noted that in such an unscreened population, the results found that 3.4% of 7,573 adult women with breast abnormalities needed further diagnostic services. Of these, eventually 5 were newly found to have breast cancer [26].

In our study, among those who ever had CBE, the majority (63.6%) underwent CBE on the recommendation of a health professional. This finding is consistent with a study carried out in urban settings of the SNNPR in Ethiopia [8]. In Ethiopia, a health professional's recommendation for cancer screening practice is also observed when recommending for breast self-examination [27]. This indicates that health professionals' recommendation is a good approach in increasing breast cancer screening practice. As shown elsewhere, CBE can be promoted successfully and performed by lower level health workers if sufficiently supported in the wider health system [28].

Among the 420 study participants, 263 (62.6%) said that breast cancer is noncommunicable. This finding is lower than the study conducted among women in Addis Ababa, Ethiopia (77.1%) [6] and higher than the study conducted among women of reproductive age in Bale Zone, Southeast Ethiopia (12.4%) [17]. This variation would be due to urban-rural variation, where urban residents are expected to have a better knowledge than rural residents; and study time difference, where knowledge level is expected to show relative increment over time. Majority of this study participants, 298 (71%), mentioned pain in the breast as a breast cancer sign and symptom. Likewise, in similar studies conducted in Addis Ababa [6] and in Bale Zone, Ethiopia [17], pain in the breast was mentioned by 50.6% and 20.5% of the respondents, respectively. Absence of breast-feeding and obesity were recognized as major risk factors for developing breast cancer by 288 (68.6%) and 269 (64%) of participants, respectively. However, smoking was recognized as a common risk factor for breast cancer by 44.6% of similar study participants [6].

In this study, only 185 (44%) of the respondents put CBE as breast cancer prevention method. In contrary, majority (78.6%) of participants in a study conducted in Bale Zone, Southeast Ethiopia [17] put CBE as a most breast cancer prevention method they know. This informs that priorities should be given to train health professionals at all levels of the health system to promote and offer CBE. The findings of this study could provide an evidence base for designing interventions to increase the intention to undergo CBE among women visiting rural healthcare facilities, thereby facilitating early breast cancer detection and increasing survival.

#### *Strengths and Limitation of the Study*

This study has certain strengths and limitation. To validate the direct measures of TPB constructs, indirect measures were developed up on the elicitation study, for

which, in-depth interviews were conducted to explore salient beliefs. However, since this study is a cross-sectional study, it fails to assess whether those intended women would undergo the CBE or not after 3 months as they reported. Thus, researchers of this study suggest follow-up study for the future.

## Conclusion

Intention to undergo CBE is lower in this study compared to other settings. Participant's higher wealth index, higher spouse educational status, positive attitude, and higher subjective norm had a relevant association with intention to undergo CBE. We recommend expansion of the formal education program and social and behavioral change communication interventions to improve self-efficacy and community activation to demand cancer screening services must go hand in hand with provider readiness to provide such services. Improving attitudes and subjective norms toward CBE by itself could also increase the uptake. Certainly, health facilities need to be prepared for the procedure, referral, diagnostic service, and patient navigation. Training "cancer nurses" could facilitate this process.

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## Statement of Ethics

This study proposal was submitted to the Instructional Review Board (IRB) of the College of Health Sciences, Addis Ababa University. The study was checked for any ethical issues and an

official letter of ethical clearance was obtained (meeting on 28 May 2020: Ref. no. 038/20/SPH). Participation in this study was completely voluntary, and an informed written consent was obtained from each study participant. Before the administration of any survey question, consent was asked in private once the interviewers share information related to the study objective and potential benefits and risks of participating in the study, confidentiality of the data, anonymous data collection procedure and, their full right to skip a particular question or total refusal of participation. Consent forms were prepared and read to the participants in the language they understand.

## Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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## Author Contributions

Bezawit Ketema contributed to the conception, proposal writing, data cleaning, analysis, and drafting of the manuscript. Mirgissa Kaba contributed to the methodological design and reviewing of the manuscript. Sarah Negash contributed to the reviewing of the manuscript. Adamu Addissie contributed to the analysis and reviewing of the manuscript. Eva Kantelhardt contributed to the interpretation of findings and reviewing of the manuscript. All authors read and approved the final manuscript.

## Data Availability Statement

Data will be available for readers upon email request to the corresponding author, Bezawit Ketema via bezawitketema@gmail.com.

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