

# Predictor of Breast Self-Examination and Breast Cancer Risk Perception among Female Students of WCU, Using Health Belief Model

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## ABSTRACT

**Background:** Breast Self-Examination (BSE) is a primary screening technique to detect breast abnormalities. By performing regular breast self-examination, women would become familiar with their breasts condition so as to enable them to detect any changes from time to time. BSE must be routinely performed by an individual female from young. This is because breast cancer can be developed at the very age of twenty. This study was aimed to assess the predictor of breast self-examination and breast cancer risk perception among female students of WCU, by using health belief model.

**Methods:** Cross-sectional study was conducted in Wachemo University female students, Hossana, Ethiopia. Data collection tool is an anonymous valid and reliable questionnaire, which acquired information about the factors affecting predictor of breast self-examination and breast cancer risk perception. The data was entered in Epi data V-3.1 and analysed using SPSS version 21. Binary logistic regression analysis was also employed to examine association between dependent and independent variables. P-value of <0.05 was considered as cut off point for significance.

**Results:** A total of 441 study subjects participated in this study making response rate of 99.3 % with mean age of the study population was 21 years. 98 % of the participants were single and 38% were protestant religion followers. Most of them 92.3% ever heard about breast cancer and 43.3% of the participants ever heard about BSE. The main source of information on breast cancer and BSE were media 74.1%. The overall knowledge of the students about breast self-examination was 61%. Good knowledge on BSE and breast cancer risk perception 5.01[2.13, 11.18], facing of breast discomfort 3.04[1.07, 9], family history of breast cancer 6.32[1.08, 14.95], high perceived susceptibility 2.5[1.2, 6.09], high perceived severity were 3.3[1.01, 8.65]) were independent predictors of breast self-examination among female Wachemo University students.

**Conclusions and Recommendation:** In this study breast self-examination among female Wachemo University students so comes to be 39.2% which is lower than other studies even if there is some similar figures were there. Intervenes should have to be needed by designing and carrying out to enhance the skills and efficacy of the female students regarding self-examinations of their breasts. Governmental organization should have to scale up breast screening service as one of the packages from youth friendly service because it's long-term consequence serious.

**Keywords:** Breast Self-Examination, Female University Students, HBM, Hossana

**Abbreviations:** BSE: Breast Self Examination; CBE: Clinical Breast Examination; CDC: Cancer Prevention and Control; HBM: Health Belief Model; NBCSP: National Breast Cancer Screening Program

## INTRODUCTION

Cancer, a dangerous and fatal disease, is a public health challenge in most populations of the world. In 2012, over fourteen million new cases of cancer and 8.2 million cancer-related deaths occurred

worldwide. Fifty seven percent of the new cases and 65% of the cancer related deaths occurred in less developed countries. Breast cancer accounts for 23% of all cancers in women, and as a chronic condition, it is the second leading cause of cancer-related deaths in women around the world. The global rate of breast cancer

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incidence ranges from 27 per 100,000 individuals in African and Middle Eastern countries to 96 per 100,000 individuals in Western European countries. Breast cancer is the most common cancer among Iranian women, with an incidence rate of 25 per 100,000 individuals [1].

Although the value of BSE is controversial, American Cancer Society recommends as an option breast awareness and BSE for early detection of breast cancer. It benefits women in two ways: women become familiar with both the appearance and the feel of their breasts and detect any changes in their breasts as early as possible. BSE makes women more "breast aware", which in turn may lead to an earlier diagnosis of breast cancer. The rationale behind extending BSE practice as a screening test is the fact that breast cancer is frequently detected by women themselves without any other symptoms [2].

Promotion of self-care, an attitude fostered early in life, may pay lifelong dividends. The adolescent period is a time of rapid change that provides teaching opportunities for shaping health behaviours into adulthood. For example, teaching breast self-care may encourage positive behaviours such as performing breast self-examination (BSE) and seeking regular professional breast examinations. Health behaviours such as BSE can help empower women to take some control and responsibility over their health promotion. For younger women, BSE education and adherence are a gateway to health promotion behaviours which set the stage for adherence to clinical breast examination and mammography screening later in life [3].

Early detection can accelerate the process of cancer treatment, significantly reduce mortality, and improve women's overall quality of life. Some studies suggest that the early detection of breast cancer through screening tests can decrease mortality rates by 25-30% [4].

## METHODS

### Study design, period and area

The study was conducted in Wachemo University regular female students by using cross-sectional design. University is located in Hadiya zone-Hossana town and 235 km far from the Addis Ababa and 194 far from the regional city Hawassa. WCU comprises of Durame campus and NEMMRH in addition to main campus. There are six colleges in WCU-main-campus and 10,371 students in regular program and from those 3,691 are female and 6,680 are male. It was conducted March 01-30/2020.

### Study population and sampling

All regular female students in Wachemo University was used as a source population. Sampled regular female students in Wachemo University was used as a study population. Sample size was determined by using single population proportion formula. By taking 21.4%, the prevalence of practice of BSE from Addis Ababa University (26), 4% marginal error, 95% CI. By adding 10% non-response rate, final sample size is 444. There are a total of 6 colleges in WCU main campus; all the colleges were included in the study. For second year and above 30% of the departments from each college was included randomly and sample size will be proportionally allocated for the number of female students in each departments. First year female students were included as natural and social separately and 30% of the total section was taken randomly from each stream and sample size was allocated

proportionally for their number. The list of female students from each department was used as sampling frame. Systematic sampling technique was used by 8<sup>th</sup>.

### Data collection instrument and data collectors

Self-report questionnaire was used to collect data from previous scientific literature and scales. This instrument included the following three subscales: 1) Demographic characteristics: age, marital status, educational status, past medical history, kind of problem, history of breastfeeding, and family history of breast cancer. 2) The Breast Cancer Knowledge (BCK) developed by Mc Cane, et al. was applied to measure participants' knowledge. The BCK is a 13 item instrument that measures subjects' knowledge of breast cancer detection and screening practices. Each correct response was scored as one and each false and "do not know" response was scored as zero. The sum of the correct answer is sum score [5]. Perception of women about breast cancer was assessed by a scale that is the modified HBM which is composed of 26 questions which was measured through use the health belief model (HBM), the statements of the HBM variables is (perceived susceptibility, perceived severity, perceived benefits and perceived barriers). The current scale was developed based on the work of many researchers. On the other hand, the modified HBM for Breast cancer instrument included 26 items on four constructions, perceived susceptibility, perceived severity, perceived benefits and perceived barriers. Participants rated these statements using a five-point Likert scale (strongly agree, agree, undecided, disagree, strongly disagree) each statement was scored from 1 to 5 where 5 indicates strong or higher perception and 1 indicates weak or lower perceptions [6].

### Data quality control

Self-administered structured questionnaire was used to collect data from the participants and the questionnaire was prepared in English. Training was given on the objective, relevance of the study, confidentiality of information, respondent's right and submission on due time. It was also pretested on 5% of the actual sample size in Durame campus female students so that to make sure clarity of the questionnaire and then necessary modifications and correction was made to ensure survey questionnaire validity. The data collection on daily basis for completeness and consistency of the filled questionnaires will be checked by principal investigator. In addition, the data will be coded; entered using Epi-data 3.1 to minimize entry errors and then it was exported to SPSS version 20.0 for analysis. During analysis, data was cleaned carefully; missing values was checked through data exploration.

### Data processing and analysis

Data were entered into EPI-DATA version 3.1 and exported to SPSS 20.0 statistical software to edit, clean for inconsistencies and missing values and finally to analyse. Different frequency tables, graphs and descriptive summaries were used to describe the study variables. Analysis of logistic regression was done to determine the predictors of Breast Self-Examination among WCU female regular students. Binary logistic regression analysis of Breast Self-Examination among WCU female regular students were used to see significance of association between dependent and independent variables. Those variables having a p-value  $\leq 0.25$  was considered as a candidate for multivariable analysis. Then entered in to Multivariable Logistic regression to get final model. Adjusted

odds ratio with 95% confidence interval that not include 1 and p-value at <0.05 was computed to assess the statistical significance and strength of association between the dependent and predictor variables. Variables having p-value less than 0.05 in logistic regression was considered significance association with dependent variables. Model fitness was checked by Hosmer and Lemeshow test and it was >0.05. Based on the findings the results were presented in text, figures and tables.

**Breast self-examination**

Is looking at and feeling each breast for possible lumps, distortions/swelling and detect any changes. The participants were asked whether they performed monthly BSE for the past 6 months. Then the participants were categorized as practiced (the students who performed BSE monthly) and not practice (those who did performed BSE monthly) [7].

**The Breast Cancer Knowledge**

There is a 13 item instrument that measures subjects’ knowledge of breast cancer detection and screening practices. Each correct response was scored as one and each false and “do not know” response was scored as zero.

**RESULTS**

**Socio-demographic characteristics**

A total of 441 study subjects participated in this study making response rate of 99.3%. The mean age of the study population was 21 years. Concerning marital status 433(98 %) of the participants were single. 43% of the participants were Hadiya by ethnicity and 38% were protestant religion followers. Around one fourth (23.8%) of the participants were from Technology college and almost half (51.1%) of the have monthly income of 500-1000 ETB (Table 1).

**Knowledge of the participants about BSE and breast cancer**

Majority of study participants (92.3%) ever heard about breast cancer and (43.3%) of the participants ever heard about BSE. The main source of information on breast cancer and BSE were media 227(74.1%) followed by health professional (14.7%) and about 37(9.7 %) of the respondents have never obtained information about either breast cancer or BSE. The overall knowledge of the students about breast self-examination was 61% (Table 2).

**Practice on breast self-examination**

The results indicated that 173(39.2%) of the 441 participants reported practicing BSEs (Figure 1).

**Past history**

From a total respondent 97.7% of them have no history of breast feeding, 39% of them faced breast discomfort and 17% of the participants have history of breast cancer in your family (Table 3).

**Perception on towards BSE**

When we see perception of participants measured by using Health Belief Model constructs; 44.9% of them have high perceived susceptibility and 58.5% of them have high perceived severity. 73% of the participants have high perceived benefit where as 47% of them have high perceived barrier. Finally 69.3% have high cues to action and 43.6% have high self-efficacy (Table 4 and Figure 2).

**Predictors of breast self-examination among female university students**

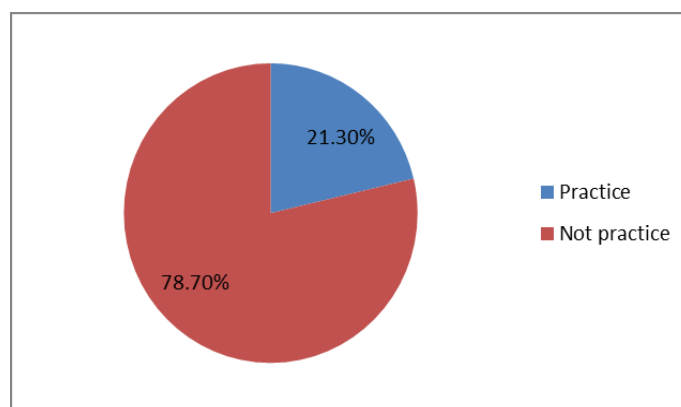
To identify Predictors of Breast Self-Examination both binary and multivariate logistic regression models were used. Accordingly, variables that were associated with Breast Self-Examination among

**Table 1:** Socio-Demographic characteristics of female students of Wachemo University Ethiopia, Jan, 2021.

Sr. no	Variable	Category	Frequency	Percent
1	Age	<20	28	6.3
		20-24	371	84.1
		>24	42	9.6
2	Year of study	2	183	41.5
		3	137	31
		>4	121	27.5
3	Marital status	Single	429	97.2
		Married	12	2.8
4	College	Medicine and Health science	76	17.2
		Technology	105	23.8
		Social	55	12.5
		FBE	78	17.7
		Agricultural	67	15.2
		Computational	60	13.6
5	Religion	Orthodox	173	39.2
		Protestant	138	31.3
		Muslim	89	20.2
		Catholic	41	9.3
6	Monthly income	<500	128	29
		500-1000	225	51.1
		>1000	88	19.9

**Table 2:** Knowledge about BSE and breast cancer of female students of Wachemo University Ethiopia, Jan, 2021.

Sr.no.	Variables		Number	Percent
1	Heard about breast cancer	Yes	407	92.3
		No	34	7.7
2	Heard about breast self-examination	Yes	191	43.3
		No	250	56.7
3	Source of information about breast self-examination and breast cancer	Media	327	74.1
		Book	9	2.04
		Health professional	83	18.8
		Others	4	0.9
		Aging	141	31.9
4	Risk factor for breast cancer	Early menarche (< 12 years)	35	7.9
		Late menopause (>55 years)	22	4.9
		Tobacco smoke	93	21.08
		Alcohol	84	19.04
		Genetic factors	75	17
		Family history of breast cancer	185	42
		Contraceptive use	49	11.1
	Evil sprit	63	14.28	



**Figure 1:** Practice on Breast self-examination among Wachemo University female students; south Ethiopia Jan, 2021.

**Table 3:** Past history of the female students of WCU 2021, Ethiopia.

Sr. no.	Variables		Number	Percent
1	Have you ever had breast feeding	Yes	10	2.3
		No	431	97.7
2	Have you ever face breast discomfort	Yes	172	39
		No	269	61
3	If yes what kind of problem	Abnormal mass	43	25
		Swelling	19	11
4	Have you ever seen a doctor about your breast discomfort	Yes	119	69
		No	53	31
5	Is there a history of breast cancer in your family	Yes	75	17
		No	366	83

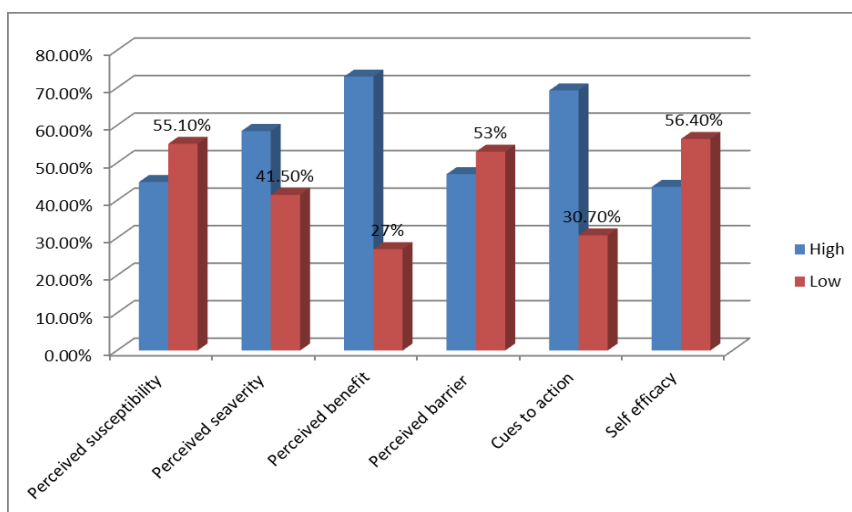
female university students under binary logistic regression were age, college of the students, year of study, knowledge about BSE, facing breast discomfort, having family history of breast cancer, perceived susceptibility, perceived barrier, cues to action and self-efficacy were significantly associated with Breast Self-Examination among female university students at p-value 0.25. The variables that showed significant association with Breast Self-Examination were adjusted for their confounders using multivariate logistic

regression were: college of the students, knowledge about BSE, having family history of breast cancer, perceived susceptibility and self-efficacy.

University female students with good knowledge on BSE and breast cancer risk perception were 5 times 5.01[2.13, 11.18] more likely practice BSE than from those with not knowledgeable. Those participants who faces breast discomfort were 3 times 3.04[1.07, 9] more likely to practice BSE than students who does not faces

**Table 4:** Perception towards BSE of female students of Wachemo University Ethiopia, Jan, 2021.

Sr.no.	Variables		Number	Percent
1	Perceived susceptibility	High	198	44.9
		Low	243	55.1
2	Perceived severity	High	258	58.5
		Low	183	41.5
3	Perceived benefit	High	322	73
		Low	119	27
4	Perceived barrier	High	207	47
		Low	234	53
5	Cues to action	High	306	69.3
		Low	135	30.7
6	Self -efficacy	High	192	43.6
		Low	249	56.4



**Figure 2:** Perception towards BSE of female students of Wachemo University Ethiopia, Jan, 2021.

**Table 5:** Multiple logistic regression analysis of variables that predicting BSE among Wachemo University female students; south Ethiopia; Jan, 2021.

Variables	BSE		COR(95%CI)	AOR(95%CI)
	Yes	No		
Age	>24	11	17	1.73 (0.61–4.92)
	<20	27	15	
Year of Study	>4	69	52	1.34(0.36–3.31)
	2	80	103	
College	CMHS	46	30	6.1[1.0, 13.5]
	Agriculture	41	26	1
Knowledge	Good	123	146	2.5[1.02,7.6]
	Poor	50	121	1
Facing breast discomfort	Yes	90	82	3.04[1.07, 9]
	No	83	186	1
Family history of breast cancer	Yes	45	30	3.7[1.4,6.3]
	No	128	238	1
Perceived susceptibility	High	77	121	3.5[0.46,8.2]
	Low	96	147	1
Perceived Barrier	High	98	109	1.24(0.09–3.76)
	Low	75	159	1
Cues to Action	High	131	175	1.9[1.4,5.02]
	Low	42	93	1
Self-efficacy	High	91	101	4.3[2.6,9.9]
	Low	82	167	1

Note: \*\*=p value<0.001, \*=p value<0.05



breast discomfort. Those participants with having family history of breast cancer were 6.32[1.08, 14.95] practice more likely BSE than from those with no family history of breast cancer. Female students having high perceived susceptibility were 2.5 [1.2, 6.09] times practice more likely BSE than from those with low perceived susceptibility. Those female students with high perceived severity were 3.3[1.01, 8.65] times practice more likely BSE than from those with low perceived severity (Table 5).

## DISCUSSION

This study is aimed to assess breast self-examination among female Wachemo University students. The breast self-examination is one screening method for identifying breast cancer in women who live in the areas with no access to advanced screening tests [8]. Correct and regular performance of BSEs can help females to detect unusual changes in their breasts related to breast cancer. It has been reported that early detection plays a role in the prompt treatment of cancer and yields a better survival rate [9]. The study indicates that 39.2% reported practicing BSE. This study is slightly lower than study conducted in Saud Arabia (41.6%), Nigeria (40%); higher than studies conducted in University students of Turkey 27%, Iran 26.6% and similar with the study of Australia (39%). This might be due to difference of community base awareness and screening program of breast self-examination in study area. The other possible explanation about this difference may be due to difference in educational status, accessibility to information or mass media, time difference and composition of the study population [10-12].

This study reveal that majority of the participants have ever heard about breast cancer and most of them get information about breast self-examination from media 74.1%. This finding is consistent with the study of Jimma shows that the main source of information on breast cancer and breast self-examination was mass media. This indicates that how university students in particular and young communities in general are near to mass media and other social Medias as well and a need to work hard in the area to address this vulnerable group [13-15].

This study shows that University female students with good knowledge on breast self-examination and breast cancer risk perception were 5 times 5.01[2.13, 11.18] more likely practice breast self-examination than from those with not knowledgeable. This finding is in line with the study conducted in Saud Arabia, Turkey and Jimma where female students with good knowledge were practice more likely than their counter parts [16,17]. This gives the clue that when individuals have adequate knowledge about some disease problem and its consequence probability of to practice the preventive behaviour is high [18-20].

This study also reveals that those participants with having family history of breast cancer were 6.32[1.08, 14.95] practice more likely BSE than from those with no family history of breast cancer and female students having high perceived susceptibility were 2.5[1.2, 6.09] times practice more likely BSE than from those with low perceived susceptibility. This result is consistent with the finding of Turkey shows that personal history about the breast cancer in the family was significant predictor of breast self-examination [21-22]. Similarity might be due that when there is perception of risky factor about getting breast cancer due to family history there may be high perceived severity in the individual that increases perceived benefit to practice preventive behaviour as well that may increase likelihood of the action that means breast self-examination [23-27].

In addition, the results revealed that the female students with high perceived self-efficacy were 11.75 times more likely to perform BSE than those with lower perceived self-efficacy [28,29]. This study is in line with the study conducted in Urmia University, female students, northwest of Iran indicated that perceived self-efficacy was the most powerful predictor of BSE, United States also clarified that perceived self-efficacy was a predictor of performing BSEs among American women found that self-efficacy (confidence) was one of the important determinants of BSE [30-31]. The findings of the above studies were consistent with this part of our findings, specifically that self-efficacy levels can increase or impede the motivation to act. When people with high self-efficacy they may ready to engage in more challenging tasks. In performing a preventive health practice, highly self-efficacious persons invest more effort and persist longer than those with low self-efficacy. In addition to that according to Health Belief Model when the individual has high confidence on the preventive behaviour their motivation to comply with the practice and exercising that likelihood of the action increases [34-39].

## CONCLUSION

In this study breast self-examination among female Wachemo University students so comes to be 39.2% which is lower than other studies even if there are some similar figures were there. College of the students, knowledge about BSE, having family history of breast cancer, perceived susceptibility and perceived severity were independent predictors of breast self-examination among female Wachemo University students.

## RECOMMENDATION

Based on the above findings the following recommendations were forwarded: Wachemo University research and community service directorate should have to intervene by designing and carrying out to enhance the skills and efficacy of the female students regarding self-examinations of their breasts. Governmental organization should have to scale up breast screening service as one of the packages from youth friendly service because it's long-term consequence serious.

## DATA AVAILABILITY

The data used to support the findings of this study are available from the corresponding author upon request.

## ETHICAL APPROVAL

Ethical clearance was obtained from the ethical review committee of Wachemo University, College of Health and Science. Then, the letter of permission was obtained from respective colleges.

## CONSENT

The purpose of the study was explained to the study participants to confirm whether they are willing to participate. Finally, written consent was obtained from each study participant before the interview, and confidentiality was secured.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

## AUTHORS' CONTRIBUTIONS

Lonsako Abute Woiloro was involved in conception, design, analysis, interpretation, and report and manuscript writing. Belay Erchafo Lubego, Tegegn Tadesse Arficho, Dawit Sullamo Erjino,

and Tagesse Sedoro Diramo were involved in the design, analysis, interpretation, and report writing. All Authors read and approved the final manuscript.

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