

# Late Diagnosis of Breast Cancer and Associated Factors Among Women Attending Hawassa University Comprehensive and Specialized Hospital Southern Ethiopia

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## Research Article

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# Abstract

**Background:** Breast cancer is a significant public health issue in sub-Saharan Africa and the second commonest cancer overall. In Ethiopia, most women present at the late-stage presentation. This is because Ethiopian government gives less attention, and is not well-studied as well. Therefore, it is important to assess delays in diagnosis and treating breast cancer that has been associated with a more advanced stage of the disease and a decrease in patient survival rates.

**Objective:** To assess the magnitude and associated factors for late diagnosis of breast cancer among women attending Hawassa University Comprehensive Specialized Hospital in Southern Ethiopia.

**Methodology:** A facility-based cross-sectional study was conducted from December to January 2019. Data were collected from 261 consecutively selected clients based on the arrival of their hospital visit by using a pretested structured questionnaire and checklist. Physicians performed physical examinations and diagnoses. Data was checked for completeness and consistency, and entered into epi data, then exported to SPSS for analysis. Descriptive, Bivariate, and multivariable logistic regression analyses were performed using SPSS Version 25 Statistical Software.

**Results:** The magnitude of late diagnosis of breast cancer was 86.3%. The woman who had no initial advice for breast biopsy [AOR=5.1, 95% (CI=1.4-18.9)], not sharing the problem to others [AOR=4.7, 95% (CI=1.8-12.2)] and using traditional and faith healers as a first treatment choice [AOR=3.3, 95% (CI=1.2 - 8.8)] were associated with late diagnosis of breast cancer.

**Conclusions:** The majority of women having breast cancer were diagnosed at a late stage. It needs attention to provide better options of the modern health service, and providing accessible initial advice for breast biopsy, and creating awareness about the benefit of sharing problems with family to improve the health of mothers by early diagnosing and managing the breast cancer.

## Background

Breast cancer incidence is rapidly growing in both developed and developing regions [1]. It is typically detected either during a screening examination, before symptoms have developed, or after a woman notices a lump [2]. Delays in cancer care are common in low-income countries, resulting in greater morbidity, higher costs of care, a lower likelihood of survival, and disability from cancer [3].

Each year, more than 14 million people are diagnosed with cancer, the majority of whom live in low- and middle-income countries (LMICs) [4]. In 2015, 8.8 million died from cancer, representing one in six deaths globally [5]. Approximately two-thirds of worldwide cancer deaths are in developing countries, where case fatality rates are higher due to late-stage diagnoses, less accessible diagnostic and treatments services [4].

Breast cancer is the most common female malignancy in most African countries, being cancer with the first or second highest incidence and/or mortality [6]. According to the Global Action Plan for the Prevention and Control of Non-communicable Diseases (GLOBOCAN), breast cancer causes 269,000 deaths in Africa. The deaths number could have risen above this if there was complete cancer registration. The number of death from breast cancer in Africa is estimated to be double by the year 2050 [4]. In sub-Saharan Africa (SSA), breast cancer survival rates are poor, diagnosis of cancer at earlier stages could prevent deaths [7].

In Ethiopia, breast cancer is the first frequent cancer next is cervical cancer. It is estimated that about ten thousands Ethiopian women have breast cancer with thousands of more cases unreported as women living in rural areas often seek treatment from traditional healers before seeking help from the government health system [6, 8]. The incidence of breast cancer in Ethiopia was 30.2%, among these late diagnoses was 85% [9]. However, Ethiopia has an increasingly comprehensive set of breast cancer prevention, diagnosis, and treatment interventions available for women [10]. However, these services are limited to certain comprehensive tertiary hospital which are very far for the most residents. Moreover, these services are mostly ineffective, and have system-related barriers. It is further worsened by the women's attitudes, and lack of awareness of breast cancers symptoms also account for a slowed-down initiation of action [13].

The magnitude of late diagnosis of breast cancer, and its determinant factors are not well studied in the area. Therefore, conducting this study was found to be very important. This can be helpful for public health officials, clinicians, and health planners to do interventions to reduce the impacts of late diagnosis of breast cancer.

## **Methods**

### **Study setting and study population**

The study was carried out in Hawassa University Comprehensive Specialized Hospital, Sidama region. The study area is located 275 km south of Addis Ababa, the capital of Ethiopia. It is expected to serve more than 18 million people of the Sidama, Southern region and the surrounding Oromia zones. The hospital provides surgical and chemotherapy treatment service for breast cancer patients including the pathologic diagnostic services. The oncology unit of the hospital provides for more than 2000 clients per year. Among these, about 600 breast cancer were diagnosed in last year, 2018.

### **Study design, and study population**

Facility-based cross-sectional study design with quantitative data was carried out in Hawassa University Comprehensive Specialized Hospital, Sidama Region, Ethiopia. The study population was all women who diagnosed for breast cancer and arrive consecutively from December to January, 2019.

## Eligibility Criteria

**Inclusion criteria:** All women diagnosed with breast cancer either newly diagnosed or on follow-up were included in the study.

**Exclusion criteria:** Those patients who had cancer from another site and disseminated to the breast, critically ill patient and patients with mental problem were excluded from study.

## Sample size and sampling procedures

The sample size (n) was calculated by using the single population proportion formula. From the similar study from Tikur Ambessa Specialized Hospital, Addis Ababa, the proportion of late diagnosis of breast cancer (p) was 88.89% [12]. 95% Confidence interval (CI) (1.96), 4% margin of error (d), and adding 10% contingency was assumed.

$$n = (Z_{1-\alpha/2})^2 \frac{P[1-P]}{d^2} \quad n = \frac{(1.96)^2(0.89)(0.11)}{0.04^2} = 236.91 \approx 237,$$

Final sample size was  $(237 + 23.7) = 260.7 \approx 261$

In this study, 261 women with breast cancer were selected consecutively based on their arrival to the hospital during the study period.

## Data collection tools, and procedures

Data were collected by face-to-face interviews by using a pre-tested questionnaire. A clinical data of the patient like; stage of diagnosis, methods, treatment planned and type of diagnoses were collected by using a pre-tested checklist (from the medical records after physicians performed diagnoses). The questionnaire was developed by the investigators after reviewing different related literature. The questionnaire was first prepared in English, and then appropriately translated into the Amharic language. The component of the questionnaire was introductory, demographic information, socio-economic information, information on reasons for delay, patient's history on diagnostic procedures, patient's history on help seeking, health awareness and behavioral factors of the patients. The interviews were conducted in outpatient and inpatient departments of oncology unit in the hospital. Four pre-trained nurses collected data under the strict supervision of principal investigator.

## Data Analysis

After data collection, each questionnaire was again visually checked for completeness, clarity, and accuracy. The data were coded and entered into EPI INFO version 7, exported into the SPSS version 25 Software. Descriptive, bivariate, and multivariable logistic regression analyses were performed. Selected variables that have a P-value of  $\leq 0.2$  at the bivariate analysis were included in the multivariable logistic regression to control all possible confounding factors simultaneously. The goodness of fit was assessed by using the Hosmer and Lemeshow goodness test. Generally, a P-value  $\leq 0.05$  was considered statistically significant.

## Operational definitions

**Late diagnosis;** patients diagnosed with breast cancer stage III and stage IV on their first diagnosis in last six month [2].

**Early diagnosis;** patients diagnosed with breast cancer stage 0, Stage I and Stage II

**Cancer staging;** is important in diagnosis in order to give appropriate management.

Breast cancer staging based on TNM classification, T stands for tumor size N for lymph node involvement depending on methods (2)

**Patient delay:** The period from a patient first becoming aware of symptoms until their first presentation to a health care provider (HCP). The duration of more than 60 days defined as “long patient delay” and 60 days or less defined as short patient delay” [15].

**Alternative therapy:** Complementary alternative therapy was defined as any therapy using methods and products not included in conventional modern medicine (traditional medicine, and traditional and religious practices [16].

## Results

### Socio-demographic characteristics

A total of 255 woman who diagnosed for breast cancer participated with a response rate of 97.70%. Majority of the respondents 219 (85.9%) were married and 183 (71.8%) were urban dwellers. Fifty-nine (23.1%) had no formal education. Nearly half 138 (54.1%) of the participants were house wives and 94 (36.9%) were employed (involved in government employee, private employee and private business). The average of parity ( $\pm$ Standard Deviation) was 3.3 ( $\pm 2.03$ ), and majority 215 (84.3%) of the women were multi-para. Sixty women (23.5%) earned below average household monthly income, (below 1050 ETB) (Table 1).

Table 1: Socio demographic characters of woman who diagnosed for breast cancer among who visit oncology department in HUCRCH in Hawassa city, Southern Ethiopia, 2020.

<b>Variables</b>	<b>Freq.</b>	<b>(%)</b>
Age		
25-29	8	(3.1)
30-34	19	(7.5)
35-39	55	(21.6)
40-44	60	(23.5)
45-49	45	(17.6)
≥50	68	(26.7)
Residence		
Urban	183	(71.8)
Rural	72	(28.2)
Marital status		
Married	219	(85.9)
Divorced	10	(3.9)
Separated	9	(3.5)
Widowed	14	(5.5)
Single	3	(1.2)
Educational status		
No formal education	59	(23.1)
Elementary	84	(32.9)
High school	47	(18.4)
College and above	44	(17.3)
First degree and above	21	(8.2)
Occupational status		
House wife	138	(54.1)
Employed	94	(36.9)
Farmer	14	(5.5)
Daily laborer	1	(0.4)
Merchant	8	(3.1)

Household monthly income		
≤ 1050 ETB	60	(23.5)
1051- 3342 ETB	131	(51.4)
> 3342 ETB	64	(25.1)
Distance to oncology center		
≤ 6 hours	143	(56.1)
6 - 12 hours	63	(24.7)
More than days	49	(19.2)

**Employed:** Government/ Civil servant + Non-Government employee,

**Income** according to WB (1\$, 1.9\$, 3.15\$/day), while (1\$=34.95ETB, 2020)

## Patient's History and patient related determinant

Out of 255 patients who attend health facilities, 253 (99.2%) and 221 (86.7%) were reported that they got consulted before being referred from hospital & specialized clinic, respectively. Out of reported cases, 100 (39.2%) on the right breast and 138 (54.1%) were had on the left breast. Regarding the lymph node status, 119 (46.7%) were documented and reported as Positive, on other hand 114 (44.7%) also had one up to three lymph node involvement. Only 4 (1.6%) of the participants had history of ever smoke cigarettes. More than half 142 (55.7%) of the respondents were diagnosed breast cancer post-menopausal. Majority 214 (83.9%) of the women breastfed their baby for more than two years and 174 (68.2%) had history of contraceptive use. As figure shows below the majority of the study participants currently 97 (38.0%) and 122 (47.8%) were on stage III and VI, respectively. While, only 3 (1.2%) were on stage II according to the TNM-Modified current stages of diagnosis (FIGO) (Figure 1).

## Patient's diagnostic pathway and reasons for delay

Out of 255 women who had breast biopsy, 111 (43.5%) infiltrating ductal carcinoma and 94 (36.9%) were ductal carcinoma in situ by histological type. In addition to this, 102 (40.0%) were well differentiated & 108 (42.4%) were moderately differentiated on their current grade. On other hand, 215 (84.3%) who had surgical margin were not documented/reported. One hundred-two (40.0%) had surgery and chemotherapy and hormonal therapy (Table 3). Regarding to delay; 135 (52.9%) patient delay more than 60 days by their own reasons and 150 (58.8%) referral delay, 163 (63.9%) health care provider's (HCP) delay and 203 (79.6%) were diagnostic results waiting time for more than 7 days. The major reasons for delay were claimed; 121 (55.5%) were wait longer than 8 weeks between their presentation and final diagnosis, 152 (69.1%) were report lack of cash money at that time, 40 (18.2%) no health facilities or temporary relief

from itself and 16 (7.3%) perceived that the cancer had no cure. On other hand regarding to the health facility, 179 (81.4%), 143 (65.0%) and 124 (56.4%) were complains that they delay due to the waiting time in the reception, waiting time to see a doctor and no appropriate physician, respectively (Table 2).

Table 2: Reasons for delay among the woman who diagnosed for breast cancer among who visit oncology department in HUCRCH in Hawassa city, Southern Ethiopia, 2020. (n=220)

<b>Variables</b>	<b>Freq.</b>	<b>(%)</b>
Above 8wks lag b/n presentation & Dx		
Yes	121	(55.5)
No	97	(44.5)
The reasons for late presentation		
Lack of cash money at that time	152	(69.1)
No health facilities	16	(7.3)
Thinking that cancer was not be cured	40	(18.2)
Temporary relief by the lesion itself	12	(5.5)
Waiting time in the reception		
Yes	179	(81.4)
No	41	(18.6)
Waiting time to see a doctor		
Yes	143	(65.0)
No	77	(35.0)
Lack of appropriate attention		
Yes	124	(56.4)
No	96	(43.6)
Being busy		
Yes	132	(60.0)
No	88	(40.0)
Patient delay		
≤ 60 days	120	(47.1%)
> 60 days	135	(52.9%)
Health care provider's (HCP) delay		
≤7 days	92	(36.1%)
>7 days	163	(63.9%)
Referral delay		
≤7 days	105	(41.2%)

>7 days	150	(58.8%)
Diagnostic waiting time		
≤7 days	63	(24.7%)
>7 days	192	(75.3%)

## The Prevalence of Late Diagnosis of Breast Cancer

The prevalence of late diagnosis of breast cancer among woman was 220 (86.3%) [95% CI: 81.7–90.1], at visit oncology department at HUCRCH (Figure 2).

## Factors associated with late diagnosis of breast cancer

In the bivariable logistic regression model, the analysis factors that had an association with late diagnosis of breast cancer were; advice for breast biopsy, residence, educational status, ever heard about mammography test, immediately share the problem to others, family history of cancer, menopausal status, and using traditional and faith healers as first choice. In the multivariate logistic regression analysis model; having no initial advice for breast biopsy, not sharing one's problem immediately to others, and using traditional healers or/and faith healers as first choice of treatments were significantly associated with late diagnosis of breast cancer.

Accordingly, the woman who had no initial advice for breast biopsy were 5 times more likely diagnosed at late stage [AOR=5.1, 95% (CI=1.4-18.9)] as compared with who had initial advised for breast biopsy. The women who did not share their problem immediately to others were 4.7 times more likely diagnosed at late stage with [AOR=4.7, 95% (CI=1.8-12.2)] as compared with who could share their problem with their family, husband and others. The study participants who use traditional and faith healers as first choice were also about three time more likely diagnosed at late stage [AOR=3.3, 95% (CI=1.2- 8.8)] as compared with their counterparts (Table 3)

Table 3: Bivariable and multivariable logistic regression analysis late diagnosis of breast cancer among woman at HUCSH in Hawassa city, Southern Ethiopia, 2020.

	Late diagnosis of BCa							
	Yes		No		COR (95%CI)	AOR (95%CI)	P-Value	
	Freq. (%)		Freq. (%)					
Advice for breast biopsy								
No	8	(57.1)	6	(42.9)	1	1		
Yes	212	(88.0)	29	(12.0)	5.48(1.78, 16.93)	5.13(1.39, 18.90)	0.014*	
Residence								
Urban	153	(83.6)	30	(16.4)	1	1		
Rural	67	(93.1)	5	(6.9)	2.63(0.98, 7.07)	2.17(0.74, 6.43)	0.160	
Educational status								
No formal education	53	(89.8)	6	(10.2)	2.04(0.77, 5.37)	1.42(0.38, 5.29)	0.601	
Elementary	76	(90.5)	8	(9.5)	2.19(0.92, 5.23)	1.44(0.40, 5.21)	0.578	
High school and above	91	(81.3)	21	(18.8)	1	1		
Ever heard about mammography test								
Yes	63	(79.7)	16	(20.3)	1	1		
No	157	(89.2)	19	(10.8)	2.10(1.02, 4.34)	2.02(0.83, 4.90)	0.122	
Immediately share the problem to others								
Yes	115	(81.0)	27	(19.0)	1	1		
No	105	(92.9)	8	(7.1)	3.08(1.34, 7.08)	4.72(1.83, 12.17)	0.001*	
Family history of cancer								
Yes	18	(75.0)	6	(25.0)	1	1		
No	202	(87.4)	29	(12.6)	2.32(0.85, 6.33)	2.28(0.74, 7.02)	0.153	
Menopausal status								
Pre-menopausal	117	(82.4)	25	(17.6)	1	1		
Post-menopausal	103	(91.2)	10	(8.8)	2.20(1.01, 4.77)	1.75(0.63, 4.81)	0.285	

					4.80)	4.91)	
Using traditional and faith healers as first choice							
No	138	(82.6)	29	(17.4)	1	1	
Yes	82	(93.2)	6	(6.8)	2.87(1.14, 7.21)	3.29(1.23, 8.80)	0.017*

NB; \* *P*-value < 0.05, was statistically significant, 1= Reference, AOR= Adjusted Odds Ratio, COR= Crude Odds Ratio, CI= Confidence Interval.

## Discussions

This study primarily assessed the prevalence and associated factors for late diagnosis of breast cancer among women attending Hawassa University Comprehensive Specialized Hospital in Southern Ethiopia. Accordingly, recent study showed that the prevalence of late diagnosis of breast cancer among the woman who diagnosed for breast cancer was 86.3%, [95% CI: 81.7–90.1]. This study result was consistent with the study reported from Addis Ababa, Ethiopia (88.89%) [12]. The possible justification for the similarity of the findings is most likely due to both studies were conducted in relatively similar socio-economic, health facilities and systems related factors. The recent finding was higher than in LMICs, between 30 and 80% are diagnosed in late stages [17, 18], 69% Tanzania [19] and 60% in Egypt [20]. This may be due to less education (in the study areas) on breast cancer especially who at higher risk of diagnosis delay, imparting adequate knowledge to its presenting signs and symptoms, also the necessity of regular self-breast examination. In addition to this majority of the rural community in the study areas still practice traditional and religious healers' alternatives before attending referral hospital. This also needs more attention on community mobilization, community-based screening programs and provide training for the traditional and religious healers.

This study finding showed that having no initial advice for breast biopsy or diagnosis is associated with late diagnosis of breast cancer. This finding is supported by the other study report from in Addis Ababa, Ethiopia [12]. This might be due to women who had no initial advice for breast biopsy diagnosis not aware on the consequence of breast cancer so they come lately to health institutions. Moreover, in Ethiopia, increasing the awareness on the breast cancer is not priority issues for the governments because government gives more priority for more very urgent health and health related issues. Furthermore, women with breast cancer have limited access to be consulted by the physicians because general hospitals are very distantly located.

Not early sharing the problem to others was also had significant association with late diagnosis of breast cancer. This finding is in line with the study conducted in Mexico [22], Columbia [23] and in Ethiopia [14]. In the culture of Ethiopia, women feel ashamed of sharing the reproductive health problem to their family members, their husband and others because breast is taken as sensitive part of the body to expose as equal as genitalia. This affects the early presentation of the women with breast cancer and contributes

to lately diagnoses of the breast cancer. In addition to this, most of the time the women in the study area were economically dependent and they cannot afford the cost of modern treatments and diagnostic modalities unless they share their problems to their family members or husband.

This study finding revealed that using traditional and faith healers as first choice was associated with late diagnosis of breast cancer. This finding is supported by the similar study finding conducted in Cote d'Ivoire [24], Malaysia [25] and India [26]. In the study area, people who unable to afford the price of the modern medicine, modern radiologic diagnosis and other direct or indirect cost, are enforced to use traditional herbal medicines and faith healers as their first-choice because it is the easily available and affordable. In addition, biopsy, fine needle cytology or a core biopsy are performed in few large tertiary hospitals and specialized secondary level facilities which are not locally available and located much miles distant away. These all have a significant contribution for the late diagnosis of breast cancer.

## **Recommendations and Conclusions**

This study has an implication to target better health practice and health seeking behavior at primary health care facilities level including health education to the women attending health facilities on screening, treatment, consequences of the late diagnosis of breast cancer. Moreover, health care system needs to provide training on modern health care system and the consequences of the late diagnosis of breast cancer for licensed traditional healers. Furthermore, health care providers need to provide consultation service on self-breast examination techniques, breast cancer screening, and informing them early symptoms can decrease the impact of the late diagnosis of the breast cancer. In addition, every woman should not be ashamed to share the reproductive health problems with their family, and health professionals also important to have successful treatment of the breast cancer.

In this study, we found a majority of the woman who diagnosed for breast cancer were diagnosed at late stage in my study. The woman who had no initial advice for breast biopsy, not sharing their problem immediately to others and using traditional medicines and faith healers as their first choice were associated with late diagnosis of breast cancer.

This was a hospital-based study. It lacks generalizability to the community at large. As this study was cross-sectional, the factors do not establish temporal relationship. Recall bias was tried to reduce but seems not completely avoided. Another limitation of recent study was small number of sample size. Future investigators should study with a large sample size with both quantitative and qualitative data inquiry.

## **Abbreviations**

<b>AOR</b>	Adjusted Odds Ratio
<b>BCRF</b>	Breast Cancer Research Foundation
<b>BSE</b>	Breast Self-Examination
<b>CBE</b>	Clinical Breast Examination
<b>CI</b>	Confidence Interval
<b>COR</b>	Crude Odds Ratio
<b>FIGO</b>	International Federation of Gynecology and Obstetrics
<b>FMOH</b>	Federal Ministry of Health
<b>Gyn</b>	Gynecology
<b>HCPD</b>	Health Care Provider's Delay
<b>IARC</b>	International Agency for Cancer Research on Cancer
<b>IUCD</b>	Intra Uterine Device
<b>MCH</b>	Maternal and Childhood Health
<b>OPD</b>	Outpatient Department
<b>OR</b>	Odds Ratio
<b>SNNPR</b>	Southern Nation Nationality and People Region
<b>TNM</b>	Tumor, Lymph node and Metastasis
<b>UNICEF</b>	United Nations Children's Fund
<b>WHO</b>	World Health Organization
<b>CSA</b>	Central Statistical Agency
<b>HUCSH</b>	Hawassa University Comprehensive and Specialized Hospital

## Declarations

### Ethics approval and consent to participate

Ethical clearance was obtained from Hawassa University College of Medicine and Health sciences and conducted in accordance with the Declaration of Helsinki and was approved by an institutional review board or ethics committee. Support letter was obtained from the Hawassa University Comprehensive Specialized Hospital medical directory. All participants were informed about the purpose, risks, benefit and confidentiality issues related to the study. Participation was on voluntary basis and written informed consent (written informed consent was obtained from legally authorized representatives of respondent for those who cannot read and write).

## Consent for publication

Not applicable.

## Availability of data and materials

The datasets used in this study are available from the corresponding author on reasonable request.

## Competing interests

The authors declare that they have no conflict of interests.

## Funding

Hawassa University provided fund for the study. The funder had no role in designing the study and conducting the analysis.

## Authors' contributions

MY, AG, and AA participated in the conceptualization, formal analysis, investigation, methodology, supervision, visualization, writing-original draft, writing-review and editing, and approving the final draft. All authors read and approved the manuscript.

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## Figures

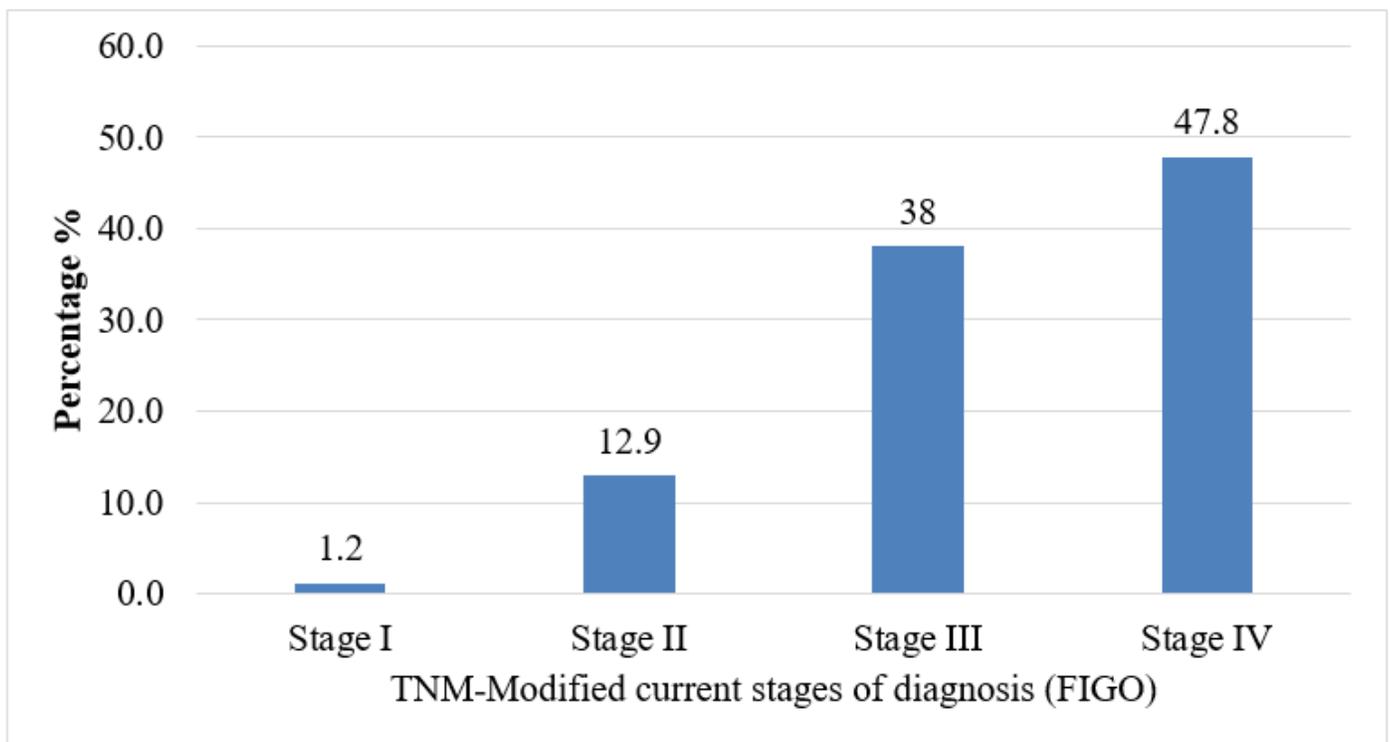
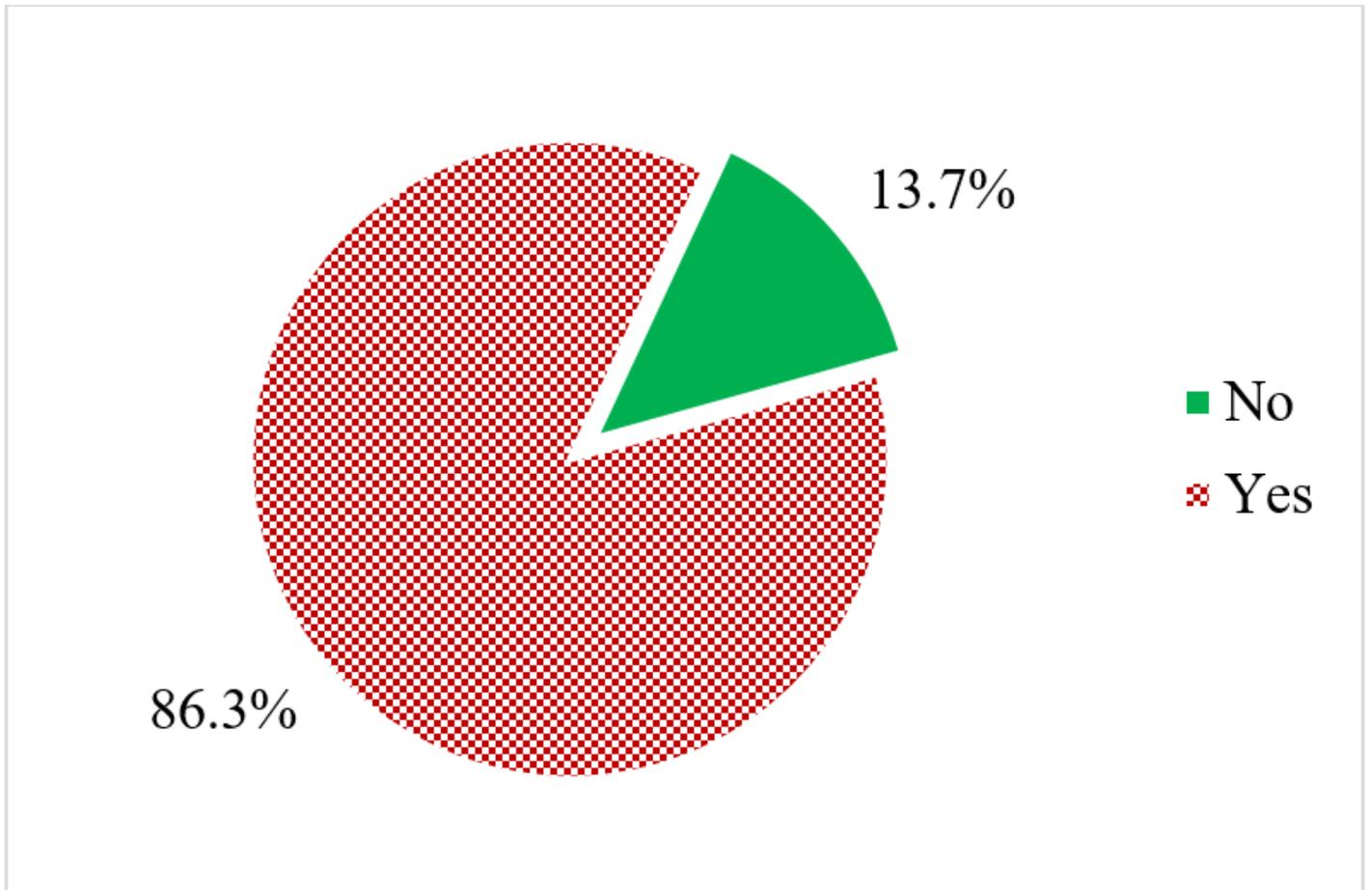


Figure 1

TNM-Modified current stages of diagnosis of woman who diagnosed for breast cancer among who visit oncology department in HUCRCH in Hawassa city, Southern Ethiopia, 2020



**Figure 2**

Late diagnosis of breast cancer among the woman who diagnosed for breast cancer among who visit oncology department in HUCRCH in Hawassa city, Southern Ethiopia, 2020.