

Cervical Cancer Screening Uptake and Determinant Factors Among Women in Ambo Town, Western Oromia, Ethiopia: Community based Cross Sectional Study

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Abstract

Background: Cervical cancer is one of the principal causes of cancer death among women worldwide. It is the second most common cancer and the leading cause of cancer-related death in Ethiopian women; about 77.6% of women died of 6,294 new cases reported in 2019. Early screening for cervical cancer has substantial advantage to reduce the incidence, morbidity, and mortality attributed to cervical cancer. So far, there are limited evidence on the level of cervical cancer screening uptake and its determinant in low- and middle-income countries including Ethiopia. Consequently, the current study aimed to assess the level of cervical cancer screening uptake and its determinant among women of Ambo town, western Oromia, Ethiopia.

Methods: A community-based cross-sectional study was conducted among 422 women aged 20-65years. Systematic random sampling was employed to recruit the eligible women from randomly selected sub-districts found in Ambo town. Interviewer-administered questionnaire was used to collect the data. Epi info was used for data entry and management from which it was exported to SPSS version 25 for detailed analysis. Variables in binary logistic regression with a *p-value* <0.25 were candidate for multivariable logistic regression. Estimates were presented using odds ratios (ORs) with 95% CI. Statistical Significance was declared at *p value*<0.05.

Results: In the present study 392 women were participated giving a response rate of 93%. Overall, 63% of the respondents were known the availability of cervical cancer screening service. Only 8.7% (34) of the study participants were received cervical cancer screening in their lifetime. Being in the age group of 30-39 years (AOR=3.2; 95% CI [1.22, 8.36]) and 40-49years (AOR=4.8; 95% CI [1.42, 16.41]), having cervical cancer related discussion with health care provider (AOR=3.5; 95% CI [1.17, 10.7]), and knowing availability cervical cancer screening service (AOR=2.8; 95% CI [1.03, 7.87]) were significantly associated with uptake of cervical cancer screening.

Conclusion: In this study, cervical cancer screening uptake is very low. The study also highlighted important factors that affect uptake of cervical cancer screening service. Therefore, this study result call urgent interventions by all stockholders to increase cervical cancer service uptake through continues promotions and by securing its availability and accessibility for all eligible women at all levels.

Introduction

Cervical cancer (CC) is the fourth most prevalent leading cause of cancer deaths among women worldwide; accounting for 311,000 women's deaths annually (1, 2). More than 99% of the cervical cancer cases result due to infection with high-risk human papillomaviruses (HPV) (HPV subtypes 16 and 18), which is transmitted through sexual contact (3, 4). Cervical cancer-related mortality is reducing in affluent countries since the launch of the formal screening program (5). In contrast, the burden and mortality as a result of CC are increasing in low and middle-income countries (LMICs) due to the absence of well-organized screening and HPV vaccination services (4, 6, 7). According to 2015 report, of 270,000 cervical cancer deaths, 243,000 was occurred in LMICs (4).

In Africa, cervical cancer is the leading cause of cancer-specific mortality in women. The incidence of cervical cancer is high in Sub-Saharan African (SSA) countries; it was 24% in the 2013 report (8). The disease is steadily increasing and result in more than 75,000 new cases and 50,000 deaths per year in SSA (9, 10). Of the African

countries, the burden of cervical cancer is higher in southern Africa. In 2018 the incidence of CC was 43.1% with a 20% mortality rate (11). Scientists predicted that by the year 2030, more than 443,000 women die of CC; and the majority (398,700) of the deaths will occur in SSA (1, 12). Ethiopia also shares a high incidence of cervical cancer. About 4,884 Ethiopian women died of 6,294 new cases reported in 2019 by the HPV information center of the country (13). Cervical cancer is the second most common cancer and the principal cause of cancer related death among Ethiopian women (14).

There are strategies launched by the World Health Organization (WHO) for controlling and prevention CC and its consequences. Vaccination for HPV and screening for eligible women are some of the proposed strategies (15, 16). Vaccination for the high-risk subtypes of HPV (5) is the primary preventive mechanism of CC (16). Infection by high-risk human papillomaviruses (HPV 16 and 18) reduced by 70% in countries where at least 50% of eligible females were vaccinated (17). Moreover, screening for the HPV at the early stage of the disease was more efficient for detecting cervical pre-cancers and provided high protection against cervical cancer (5, 18, 19).

In high-income countries, the screening methods shifts from cytology-based to molecular screening, and co-testing to achieve the anticipated goals (6). On the other hand, visual inspection with acetic acid (VIA), HPV testing-based screening, and a “single-visit screen and treat”(20) are the alternative screening methods in LMICs (6, 21). Cervical cancer incidence (25%) and mortality (35%) was reduced as a result of a single round screening with VIA (22). Moreover, a randomized control trial (RCT) in rural India revealed a significant reduction of advanced cervical cancer (53%) and deaths (48%) with a single round screening with high risk- HPV testing compared with the existing standard of care only for opportunistic screening (23).

Though, WHO recommended screening of women aged 30-49years (24) and screening for cervical cancer between age 21 to 65years substantially reduces cervical cancer incidence (25), advanced stage of the disease (23), and mortality (22, 23, 25, 26); still, there are different barriers that hinder the utilization of the screening services. Absence of linkage of diagnosis and treatment (6), traditional practices and beliefs (27, 28), socioeconomic status (29–31), public awareness (31, 32), fear of cancer and out-comes of screening (31–33), and health care access (30, 31, 33) are barriers of cervical cancer screening uptake mainly in LMICs. A few qualitative studies identified the lack of understanding of the benefits of the screening as barriers to CC screening in LMICs (28, 31). A systematic literature review indicated that lack of partner support, social stigmatization, cost of the services, and health care providers' attitudes were barriers to cervical cancer screening service utilization in SSA (33).

Studies have shown that education intervention and self-sampling for HPV testing increased cervical cancer screening rates by fold (34, 35). Likewise, awareness of cervical cancer, family history of the disease, and experiencing the signs and symptoms of the disease were facilitators for the utilization of screening services by the women (31). In the study area, data related to the level of CC screening uptake and determinant factors is lacking: thus, the present study aimed to assess the level of cervical cancer screening uptake and determinant factors among women of Ambo town, western Oromia, Ethiopia.

Methods

Study area, period, and participants

A community-based cross-sectional study was conducted from December 01, 2017 to January 30, 2017, in Ambo town capital of west Shewa zone, western Ethiopia. The town is located 114 kilometres to the west of Addis Ababa.

According to the health planning, monitoring, and evaluation department report, the town has a total of 97,317 population, of which 18.6% of them were women of reproductive age group.

In Ambo town there are six sub-districts, one general, one referral and teaching hospital, two health centers, one Maternal and child health (MCH) clinic, and twenty private clinics that were providing different reproductive health services in the town. Currently, it is only the government hospitals that providing cervical cancer screening services. All women aged between 20 and 65 years who are residing in Ambo town were the source population. Consequently, randomly selected women aged 20-65years (25) and who reside in the town during the data collection period were the sample population.

Sample size and sampling procedure

The sample size was calculated by using the single population proportion formula with the assumption of 95% CI, 50% proportion of women who uptake cervical cancer screening services, and 5% margin of error was used to obtain a sample size of 384, with adjustment of 10% non-response, the final sample size was 422.

$$n = \frac{1.96^2 * 0.5(1-0.5)}{0.05^2} = 384$$

From six sub-districts of Ambo town, three sub-districts; namely sub-districts 01, 02, and 06 were selected by a simple random sampling technique. A total of 6705, 3513, and 3306 eligible women were found in sub-districts 01, 02 and 06, respectively. From those respective sub-districts the sample size for this study was proportionally allocated; accordingly, 209, 109, and 103 women were selected from sub-districts 01, 02, and 06, respectively. Study participants were selected by systematic random sampling technique. The first household with eligible subject was selected by the lottery method and then every 36th household with eligible subject were included in the study. Women aged 20-65years were interviewed from the selected households and if there were more than one woman in the household, the lottery method was used to select one.

Data collection tools and data collectors

The questionnaire was adapted from similar studies conducted in Gonder town (36), Jimma (37), and India (38). It was first prepared in English and then translated to local language (Afan Oromo) and back-translated into English by language experts to ensure its consistency. An interviewer-administered pre-tested questionnaire was used for data collection. A pre-test was done on 5% women live in different sub-districts to avoid contamination of information. The data were collected by six BSc Nurses and supervised by two MSc Nurses. Data collectors and supervisors were trained for two days before data collection. Personal identifiers were not included in the questionnaires to ensure the participants' confidentiality. Supervisors and principal investigator checked the completeness of the questionnaires daily.

The tool covers variables like: socio-demographic characteristics, reproductive and sexual history, cervical cancer and screening knowledge, and cervical cancer screening uptake.

Operational definitions

Cervical cancer screening uptake

The proportion of women who have ever been screened for cervical cancer at least once in their life time (39).

Data processing and analysis

Data were coded, entered, and cleaned using Epi info version 3.5.1 and exported to SPSS version 25 statistical package for analyses. Descriptive statistics were computed and presented using tables and figures. The outcome variable is dichotomous coded as "1" when the respondents were screened for CC, otherwise "0". Frequencies and proportions were calculated for a description related to socio-demographic and other variables. Relationships between dependent and independent variables investigated using the Binary logistic regression model. Those variables with p-value below 0.25 in bivariate logistic regression were included in a multivariate logistic regression model for controlling potential confounding effects. The independent predictors for cervical cancer screening uptake are presented using adjusted odds ratio (AOR) with its 95% CI. A statistical significance was established as $p < 0.05$.

Results

Socio-demographic characteristics

A total of 392 women aged 20-65years old interviewed making a 92.9% response rate. The mean age of the study participants was 30.1 years (± 9.1 SD). The majority (96.4%) of the respondents were from the Oromo ethnic group. About two-third of the women were married, and 117 (29.8%) of them completed college and above. Nearly half (48%) of the women were housewives in their occupation (Table 1).

Table 1
Socio-demographic characteristics of study participants in Ambo town
western Oromia, Ethiopia, December-January 2017

Variable (n = 392)	Category	Frequency	Percentage
Age(yrs)	20–29	228	58.2
	30–39	109	27.8
	40–49	34	8.7
	> 49	21	5.4
Ethnicity	Oromo	378	96.4
	Others*	14	3.6
Religion	Orthodox	151	38.5
	Protestant	228	58.2
	Others**	13	3.3
Marital status	Single	97	24.7
	Married	254	64.8
	Divorced	17	4.3
	Widowed	24	6.2
Educational status	Illiterate	67	17.1
	Attend primary	103	26.3
	Attend secondary	105	26.8
	College and above	117	29.8
Occupation	House wife	88	48
	Private employee	42	10.7
	Governmental employee	80	20.4
	Daily laborer	38	9.7
	Student	44	11.2
Income	No income	37	9.4
	100–1000 ET birr	157	40.1
	> 1000 ET birr	198	50.5
* Amhara and Gurage, **Catholic, and waqefata, Musilim			

Reproductive characteristics of the respondents

About 256 (65.3%) of the participants had a single sexual partner, while the rest (34.7%) had multiple sexual partners in their lifetime.

Two hundred and forty-three (62.0%) of the participants had two and above pregnancies (Table 2).

Table 2
Reproductive characteristics of the study participants in Ambo town, western Oromia, Ethiopia, December-January 2017

Variable (n = 392)	Category	Frequency	Percent
Age at first intercourse	< 18 years	159	40.6
	≥ 18 years	233	59.4
Have you been pregnant	Yes	324	82.7
	No	68	17.3
Number of pregnancy	< 2	149	38.0
	≥ 2	243	62.0
Have you give birth	Yes	300	76.5
	No	92	23.5
Number of children	< 2	156	39.8
	≥ 2	236	60.2
Lifetime number of sexual partner	Single partner	256	65.3
	Multiple partner	136	34.7
History of abortion	Yes	47	12.0
	No	345	88.0
History of contraceptive use	Yes	208	53.1
	No	184	46.9

Knowledge of cervical cancer

Three hundred and eight (78.6%) subjects have ever heard of cervical cancer; mass media was the most sources of information reported by study subjects (Fig. 1).

Of the study participants, only 180(45.9%) of them know of cervical cancer, while more than half (54.1%) of the women did not know cancer of the cervix.

Most (68.3%) of the women reported unusual vaginal bleeding as the symptom of CC, while the rest reported vaginal discharge mixed with blood (42.2%), dyspareunia (32.2%), pelvic pain (12.8%), and the least reported back pain (2.2%) as the symptom of CC. Regarding the preventive mechanisms of cervical cancer, only 45(11.5%) and 15(3.8%) of the women knew HPV vaccination and screening for cervical cancer prevent CC, respectively.

Cervical cancer screening uptake and reason for not getting screened

Only 34 (8.7%) of the women had ever screened for cervical cancer in their lifetime. However, 247(63.0%) of the women had knowledge about cervical cancer screening.

Papanicolaou (Pap) test (44.1%) was the most screening type reported by respondents who had ever screened for cervical cancer, followed by a blood test (35.3%), and visual inspection with acetic acid (VIA) (20.6%). Not getting sick of CC is the main reason for non-utilization of CC screening services (Fig. 2).

Factors associated with uptake of cervical cancer screening

In bivariate logistic regression analysis: age, knowing the availability of the screening service in the public hospital, history of early sexual initiation, know the consequence of advanced cervical cancer (metastasis and bleeding), knowledge of CC screening, and discussion on cervical cancer with health care providers were statistically significant with the uptake of cervical cancer screening.

However, in multivariable logistic regression analysis; age, knowledge on the consequence of advanced cervical cancer (metastasis and bleeding), knowledge of CC screening, and discussion with health care provider on CC screening were remained significantly associated with cervical cancer screening uptake (Table 3).

This study indicated that those women who were in the age group of 30–39 years and 40–49 years were 3.2 times (AOR = 3.2; 95% CI [1.22,8.36]) and 4.8 times (AOR = 4.8;95% CI [1.42,16.41]) more likely to uptake cervical cancer screening compared to those women whose ages between 20-29years, respectively. Those women who knew giving birth to many children as risk factor for cervical cancer were 2.7 times (AOR = 2.7; 95% CI [1.26, 5.98]) more likely to utilize cervical cancer screening compared to their counterparts. Women who had knowledge about cervical cancer screening were 2.8 times (AOR = 2.8; 95% CI [1.03, 7.87]) more likely to uptake cervical cancer screening than their counterparts. Furthermore, the present study found that knowledge on the consequences of advanced cervical cancer increases the uptake of cervical cancer screening by the study subjects. Those women who knew metastasis and bleeding were the consequence of advanced cervical cancer were 2.9 times (AOR = 2.9; 95% CI [1.20, 6.95]) and 3.1times (AOR = 3.1; 95% CI [1.16, 8.29]) more likely to utilize the CC screening service than their counterparts, respectively.

Table 3

Determinants of cervical cancer screening uptake among women of Ambo town, western Oromia, Ethiopia, December-January 2017

Variables	Total	Cervical cancer screening uptake		COR,95%CI	AOR,95% CI
		Yes No(%)	No No(%)		
Age(yrs)					
20–29	228	10(4.4)	218(95.6)	1.00	1.00
30–39	109	14(12.8)	95(87.2)	3.2(1.38,7.5)*	3.2(1.22,8.36)*
40–49	34	6(17.6)	28(82.4)	4.7(1.57,13.84)*	4.8(1.42,16.41)*
> 49	21	4(19.0)	17(81.0)	5.1(1.46,18.09)*	4.3(0.94,19.58)
Education status					
Illiterate	67	8(11.9)	59(88.1)	1.00	1.00
Attend primary education	103	12(11.7)	91(88.3)	1.0(0.38,2.52)	1.1(0.42,3.09)
Attend secondary education	105	7(6.7)	98(93.3)	0.5(0.18,1.53)	0.8(0.26,2.43)
College and above	117	7(6.0)	110(94.0)	0.5(0.16,1.36)	0.9(0.26,2.89)
Marital status					
Single	97	5(5.2)	92(94.8)	1.00	1.00
Married	254	24(9.4)	230(90.6)	1.9(0.71,5.2)	1.0(0.29,3.10)
Divorced	27	2(7.4)	25(92.6)	1.5(0.27,8.04)	0.5(0.07,3.06)
Widowed	14	3(21.4)	11(78.6)	5(1.1,23.93)*	1.7(0.26,11.48)
Income					
< 100 ETH birr	37	1(2.7)	36(97.3)	1.00	1.00
100– 1000 ETH birr	157	17(10.8)	140(89.2)	4.4(0.56,33.95)	4.5(0.52,39.22)
> 1000 ETH birr	198	16(8.1)	182(91.9)	3.2(0.41,24.63)	2.9(0.32,26.80)
Give birth to many children					
Yes	80	15(18.8)	65(81.3)	3.6(1.72,7.37)*	2.7(1.26,5.98)*
No	312	19(6.1)	293(93.9)	1.00	1.00
Screening service availability					
Yes	48	8(16.7)	40(83.3)	2.5(1.04,5.77)*	1.9(0.75,4.81)
No	344	26(7.6)	318(92.4)	1.00	1.00

Variables	Total	Cervical cancer screening uptake		COR,95%CI	AOR,95% CI
		Yes	No		
		No(%)	No(%)		
Early sexual initiation risk for CC					
Yes	38	9(23.7)	29(76.3)	4.1(1.74,9.57)*	2.2(0.86,5.70)
No	354	25(7.1)	329(92.9)	1.00	1.00
Knew metastasis					
Yes	53	11(20.8)	42(79.2)	3.6(1.64,7.91)*	2.9(1.20,6.95)*
No	339	23(6.8)	316(93.2)	1.00	1.00
Knew bleeding					
Yes	30	9(30.0)	21(70.0)	5.8(2.39,13.93)*	3.1(1.16,8.29)*
No	362	25(6.9)	337(93.1)	1.00	1.00
Knowledge on CC screening					
Yes	247	29(11.7)	218(88.3)	3.7(1.41,9.85)*	2.8(1.03,7.87)*
No	145	5(3.4)	140(96.6)	1.00	1.00
Knowledge on cervical cancer					
Yes	180	19(10.6)	161(89.4)	1.6(0.76,3.15)	1.0(0.44,2.16)
No	212	15(7.1)	197(92.9)	1.00	1.00
Discussed CC with HCP					
Yes	31	6(19.4)	25(80.6)	2.9(1.08,7.54)*	3.5(1.17,10.7)*
No	361	28(7.8)	333(92.2)	1.00	1.00
Heard cervical cancer					
Yes	308	31(10.1)	277(89.9)	3.0(0.9,10.14)	2.7(0.73,9.69)
No	84	3(3.6)	81(96.4)	1.00	1.00
CC = cervical cancer, HCP = health care provider, *p-value < 0.05					

Discussion

A total of 392 women participated in the study gives a response rate of 92.9%. In this study, only 8.7% of women reported that they ever had a screening for cervical cancer. The finding was similar to a study conducted in Ilorin,

North Central Nigeria (8%) (40) and in Hosanna town (10%) of Ethiopia (41) .

However, the level of cervical cancer screening uptake of the present study was lower than former studies conducted in Dessie town (11%) (42), Mekele town (20%) (43), and Debremarkos town (21%) of Ethiopia (44). These discrepancies may be due to the difference in service availability in the study area and design, study participants awareness towards CC, and the age of the women included in the studies. In the Bante et al study (44) all the reproductive age group of women were included, whereas the present study included only women in the age group of 20-65years which is eligible for the cervical cancer screening (25). Another study (45), also indicated that 17% of undergraduate female University students were underwent cervical cancer screening in their life time. The level of screening from this study also higher than that of the present study; the reason might be due to the variation of awareness level among the university students and women in the general community. Studies showed that women who had higher level of education (46–48) and knowledge on cervical cancer (41–43), and its screening (43, 47) were more utilized the screening services than their counterparts.

Conversely, the cervical cancer screening level of the present study was higher than the community based studies conducted among women in Finote-Selam city (7.3%), north west Ethiopia (49), in Butajira district, (2.3%), southern Ethiopia (48), and in Debre Markos town (5.4%), northwest Ethiopia (47). The inconsistencies might be due to the difference in study setting and age groups included in the studies.

The current study revealed that: age (being within the age group of 30-39yrs and 40-49yrs), knew metastasis and bleeding are the consequences of advanced CC, and Knowledge on CC screening, discussion with health care provider on CC screening, and give birth to many children were predictors of cervical cancer screening uptake. Women in the age group of 30-39years (3.2 times) and 40-49years (4.8 times) more likely to be screened for cervical cancer compared to the reference group (those aged between 20-29years). The finding was in line with studies conducted in public hospitals found in the Tigray region (50) and Mekele town (43) that reported being aged between 30-39years were 2 times more likely to utilize screening services than those who were 21-29years old. Moreover, the likely hood of cervical cancer screening uptake is increasing as age increased. Those women whose age ranges 40-49years were 4 times (50), 3.1times (47) and 2.4 times (51) more likely to utilize the screening services compared to 21–29 years old. Also studies conducted in Dessie town (42), Debre Markos town (44), and Finote Selam city (49) revealed that women aged between 34–49 years were, 6.0 times, 3.2 times, and 2.8 times more likely to be screened for CC than the younger age group, respectively.

Had a discussion with health care providers about cervical cancer screening was also increasing its utilization; those women who had ever discussed with the health care providers about CC screening were 3.5times more likely to be screened than their counterparts.

This finding also supported by studies conducted in Debre-Markos town and Bahir-Dar city (44, 52), which revealed that being informed about CC screening by health professionals increases its utilization by 6.8 folds. Former studies also indicated that knowledge on cervical cancer screening was increased CC screening uptake by 2.36 fold (43) and by 4.02 fold (47). The present study also inaconcordance with those studies; women who had knowledgeable of cervical cancer screening were 2.8 times more likely to uptake cervical screening than those who did not know the screening.

Furthermore, the present study revealed that the knowledge of metastasis and bleeding are the outcome of untreated CC which is due to lack of cervical cancer screening uptake. Those women who knew metastasis and

bleeding were 2.2 and 3.1 times more likely to utilize CC screening, respectively, than those who did not know the advanced cervical cancer. Bezabih and his colleagues revealed that the risk of invasive cervical cancer is 10.3 times higher among women who had more than 4 children (37). This finding is in agreement with our result multipara women were 2.7 times more likely to uptake cervical screening than null para women.

The main reason for not up taking the cervical cancer screening were self-perceived health (85.8%), lack of information (13.4%), and fear of screening test result (2.8%). This result also in harmony with studies conducted in Hossana, southern Ethiopia (53) and Addis Ababa (54) that indicated a lack of information and awareness were barriers to CC screening uptake. Cluster-randomized trial study conducted in Butajira district showed that self-assertion of being healthy and fear of screening were the main reason for non-utilizing screening services (55).

Conclusion

In this study, cervical cancer screening uptake is low. Knowledge about CC screening, had discussion with HCP about cervical cancer screening, and knowledge metastasis and bleeding as they are the consequences of advanced CC were the main predictors of cervical cancer screening uptake. Therefore, this study result call urgent interventions by all stockholders and specially the health sector should give priority on continues promotions to equip the women with good knowledge about CC screening and ensure its utilization through securing its availability and accessibility for all eligible women at all levels.

Abbreviations

AOR: Adjusted odds ratio

CI: Confidence Interval

COR: Crude Odds Ratio

CC: Cervical cancer

HPV: Human papilloma virus

LMICs: Low and middle incomes countries

SSA: Sub-Saharan Africa

VIA: Visual inspection with Acetic Acid

WHO: World Health Organization

Declarations

- **Ethics approval and consent to participate**

The study was approved by the ethical Review committee of the College of Medicine and Health Sciences (CMHS-ERC) of Ambo University, Ethiopia and all performed procedures were in accordance with the 1964 Helsinki declaration and its later amendments. Written informed consent was sought from all participants after the aim of the study was introduced. Confidentiality of the gathered information was assured to the interviewee.

• **Consent for publication**

Not applicable

• **Availability of data and materials**

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

• **Competing interests**

The authors declare that they have no competing interests

• **Funding**

No funding was obtained for this study

• **Authors' contributions**

SHFN & DTSN: involved in the proposal development, analysis and interpretation of the data and prepared the manuscript. WW and MKN: involves in the preparations of the manuscript and reviewing the paper. All authors read and approved the final manuscript

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Figures

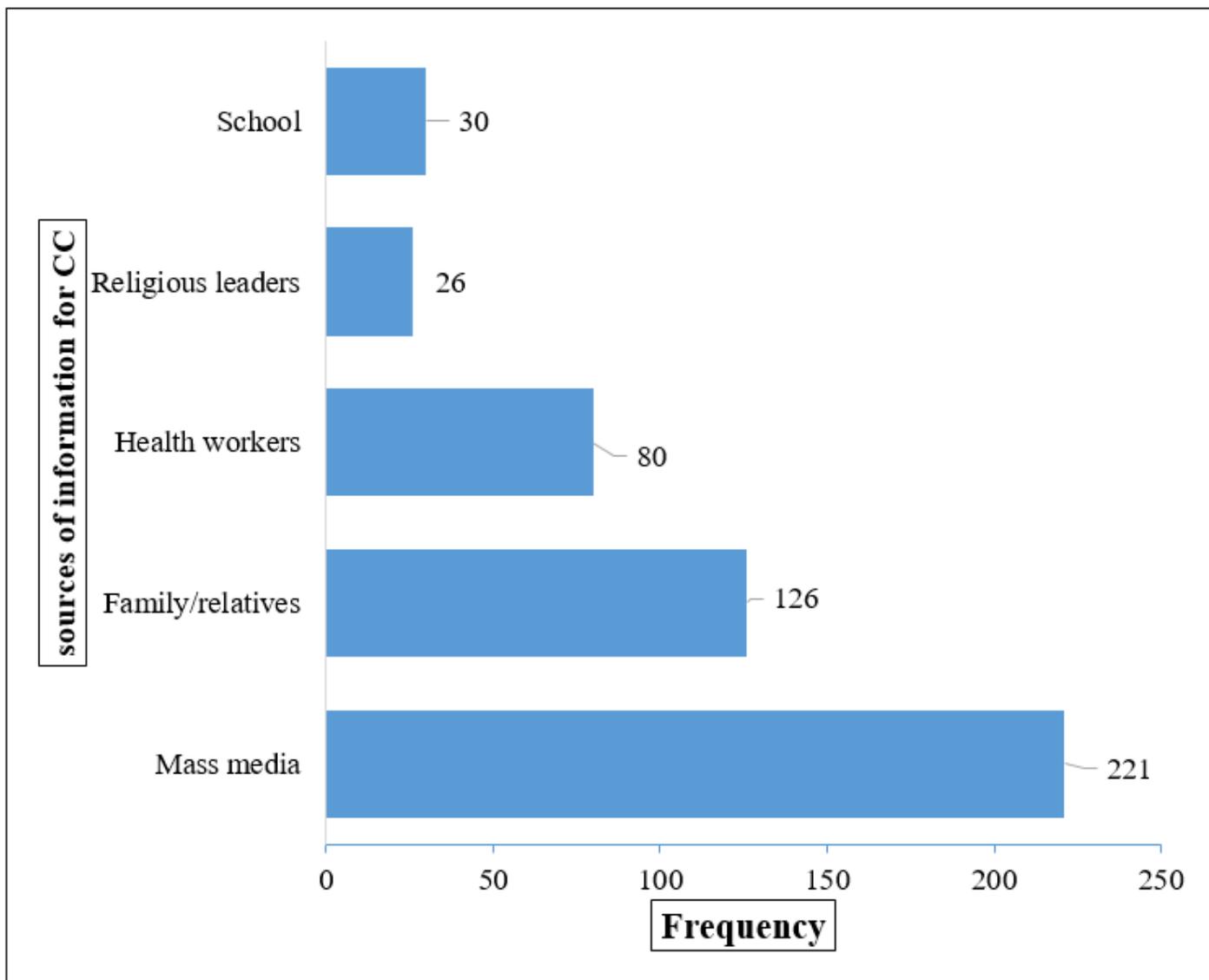


Figure 1

Sources of information of cervical cancer reported by the study subjects (multiple responses were considered; thus the sum might be more than sample size)

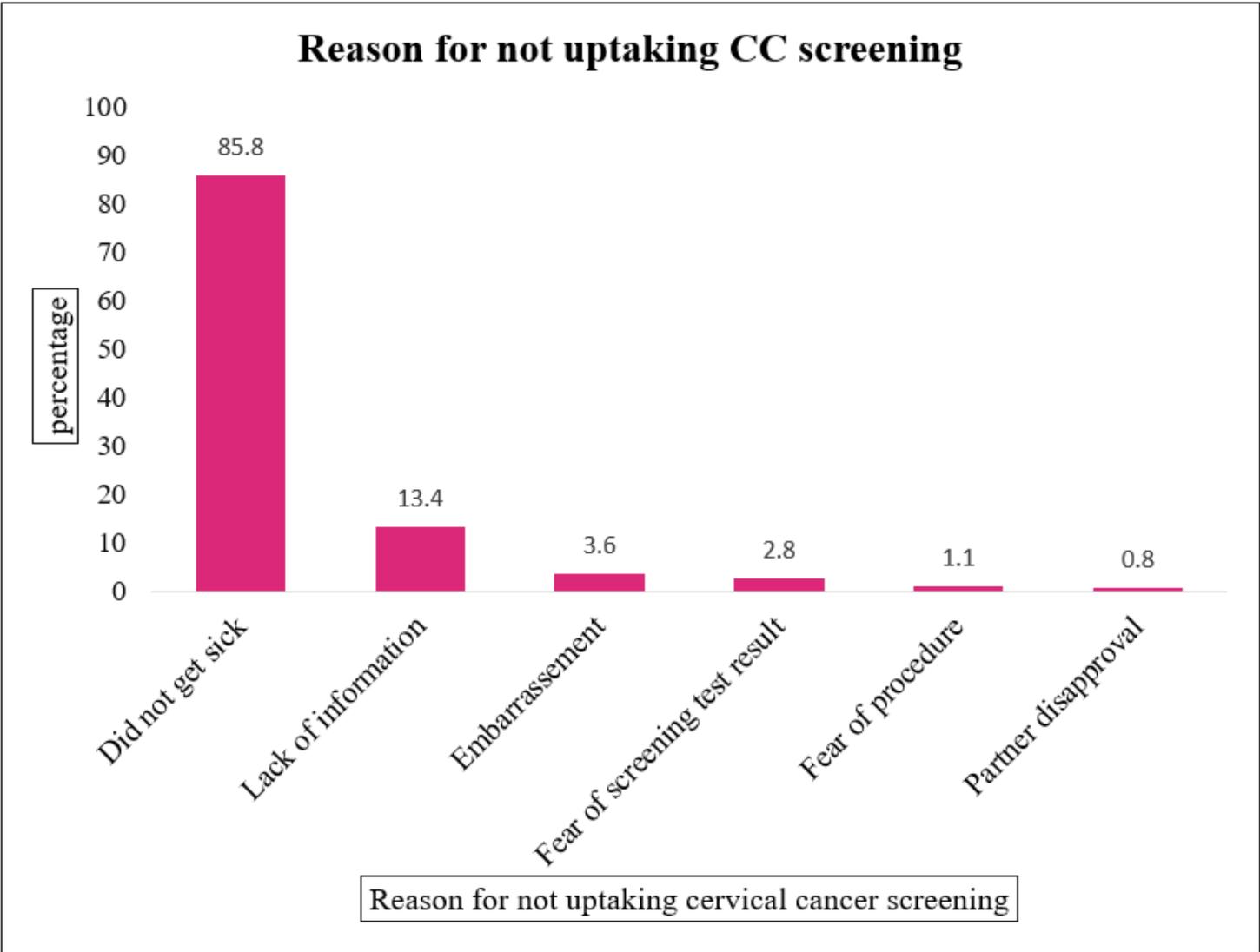


Figure 2

Main reason for not up-taking cervical cancer screening by women of Ambo town, western Oromia, Ethiopia, December-January 2017