



# Knowledge of Cervical Cancer and Associated Factors Among Women Attending Public Health Facilities in Eastern Ethiopia

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**Purpose:** This study was done to assess women's knowledge of cervical cancer and associated factors.

**Materials and Methods:** We conducted a facility-based cross-sectional study in eastern Ethiopia from January 1 to May 30, 2019. A convenient sampling technique was used to include 1181 women in this study. Information on socio-demographic characteristics, sexual history, knowledge and awareness of women was collected using face-to-face interview. The data were cleaned, coded and entered into EPI-info version 3.5.4 and then exported to Statistical Package for Social Science version 23.0 software for analysis. The associations between independent variables and outcome variables were assessed using bivariate and multivariable logistic regressions. The results of these analyses were reported as odds ratios with 95% confidence intervals. We declared statistically significant variables at a *p*-value less than 0.05.

**Results:** Nearly half (574, 48.6%) of the participants have ever heard about cervical cancer. One hundred and thirty-nine (24.2%) of them did not know any of the risk factors. The majority of them mentioned bleeding after intercourse (329, 57.4%) as a symptom of the disease. Overall knowledge assessment revealed that 288 (55.7%) participants had adequate knowledge about cervical cancer. Participants' age in the range of 40–49 years (AOR: 2.58, 95% CI 1.99–5.57), having educational level above 12th grade (AOR: 12.11, 95% CI 4.57–32.09) and receiving information about the disease from healthcare professionals (AOR: 2.72, 95% CI 1.69–4.37) were independently associated with adequate knowledge of cervical cancer.

**Conclusion:** The knowledge of women towards cervical cancer in our study area was inadequate. The respondents' age, educational status and source of information were independently associated with study participants' knowledge of cervical cancer. Young women with no formal education should get special focus in prevention strategies and we also recommend regular and effective counselling, and education about cervical cancer at health institutions.

**Keywords:** cervical cancer, knowledge, associated factors, Ethiopia

## Introduction

Cervical cancer is the fourth most common cancer among women after breast, colorectal and lung cancers. It is well proved that cervical cancer is the most preventable and curable disease if detected and treated early. However, in many developing countries cervical cancer continues to be the common cause of death among women between 25 and 49 years of age. According to the world statistics report in 2018, globally there

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were 570,000 new cases of cervical cancer and 311,365 deaths due to this disease. Eastern Africa is among the severely affected regions by cervical cancer with 52,633 new cases and 37,017 deaths annually.<sup>1-3</sup>

Ethiopia has a population of 29.4 million women who are at risk of developing cervical cancer. In Ethiopia, cervical cancer was the second most frequent cancer among women between 15 and 44 years of age and 6,294 women were diagnosed with cervical cancer and 4,884 died of this disease. An absence of prevention strategies is the main obstacle to cervical cancer prevention and control in developing countries.<sup>4-7</sup> It is evidenced that knowledge of cervical cancer affects cervical cancer screening uptake in different countries. Women who have adequate knowledge utilize the service more than women who have inadequate knowledge about cervical cancer.<sup>8,9</sup>

Women's knowledge of cervical cancer in sub-Saharan African countries is low as compared to other regions of the world.<sup>10,11</sup> Different studies also revealed that knowledge of women about cervical cancer is very low in Ethiopia.<sup>12-16</sup> The majority of respondents in previous studies have heard about cervical cancer, but not more than half of respondents know what causes cervical cancer and the risk factors associated with the disease.<sup>17,18</sup> Women's age, marital status, occupation, educational status, source of information, knowing someone with cervical cancer and health-seeking behavior were found to be associated with cervical cancer knowledge in Ethiopia.<sup>19-22</sup> However, none of these studies have assessed the association of HIV status and using family planning methods with the knowledge of cervical cancer.

Cervical cancer screening is extremely low in Ethiopia and the Harari region is at the bottom line with only 2.2% of eligible women screened.<sup>23</sup> As knowledge about cervical cancer is an important factor for practising the screening, it would be crucial to identify the knowledge and associated factors. Therefore, this study aims to fill that by providing evidence on the level of knowledge of cervical cancer and associated factors among women in Harar city, eastern Ethiopia. Additionally, the study was done to measure the association of those factors which were not addressed by previous studies in Ethiopia. The output of this study provided evidence-based information to the hospital administrations, Harari regional health bureau and nongovernmental organizations to exert a maximum effort to improve cervical cancer knowledge and screening utilization.

## Materials and Methods

### Study Design, Study Area and Period

The study was a descriptive cross-sectional study conducted among women attending gynecology OPD (Out Patient Department), ART (Anti-Retroviral Therapy) clinic and family planning units in two public hospitals in Harar city, eastern part of Ethiopia. Hiwot Fana Specialized University Hospital (HFSUH) is a teaching referral hospital of Haramaya University with 900-bed capacity that has been delivering healthcare services to Harari region and its surrounding population. Jugal Hospital is a regional referral hospital of the Harari National Regional State. A cervical cancer screening service was launched in 2016 in both hospitals. This study was conducted from January 1 to May 30, 2019.

### Study Participants, Sample Size and Sampling Procedure

All women between 25 and 49 years of age attending the selected outpatient clinics of either hospital during the study period were included in the study. Critically ill patients who did not give informed consent were excluded from the study. The minimum sample size was calculated by using a single population proportion formula,  $n = Z^2 p (1 - p) / d^2$  with assumptions of margin of error 3% ( $d = 0.03$ ), standard error corresponding to 95% confidence interval level ( $Z = 1.96$ ) and the proportion of women who were knowledgeable about cervical cancer from a previous study ( $p$ ) of 43.8%.<sup>17</sup> The calculated sample size was 1051 and after adjusting for a non-response rate of 10%, the final sample size was 1157 women. We have also calculated the sample size for the analytical part of this study. This article is part of a project and we used the maximum sample size calculated among the objectives of this project, which was 1240 women. The sample size was allocated proportionally based on the size of the case-load to each hospital. A serial (convenient) sampling technique was used to recruit study participants.

### Data Collection

A structured and pretested questionnaire was used to collect information on socio-demographic characteristics, sexual history and knowledge of women. Following the verbal consent, an exit interview was conducted by trained bachelor degree nurses and midwives who were not employed in either of the hospitals. The knowledge questions were adopted from previous studies and a total of 14 questions (4 risk factors related, 6 symptoms related and 4 prevention related questions)

were presented to study participants.<sup>24,25</sup> We adopted a similar scoring system from another study to assess cervical cancer knowledge.<sup>20</sup> Score one was assigned if the risk factors, symptoms and prevention methods were correctly identified by the respondents. On the other hand, a score of zero was given if the respondent answers the incorrect or “I don’t know” response. The maximum score for the total knowledge questions was 14 and respondents with an average score of greater than seven ( $>7$ ) were categorized as having adequate knowledge of cervical cancer, while respondents with a score less than or equal to seven ( $\leq 7$ ) were categorized as having inadequate knowledge. The reliability of items was evaluated by using Cronbach’s alpha, and in the present study Cronbach’s alpha was 0.78 which indicates good internal consistency. This study was conducted in accordance with the Declaration of Helsinki and it was approved by the Haramaya University institutional health research ethics review committee. Written and signed informed consent were obtained from each study participant and head of both hospitals prior to interview. The data collection procedure was anonymous in order to keep the confidentiality of any information provided by the study participants.

## Data Analysis

The collected data were entered into EPI-info version 3.5.4 and then exported to SPSS (Statistical Package for Social Science) version 23.0 software for analysis. Descriptive statistics like frequencies, percentages and cross-tabulations were done. Binary logistic regressions were used to check associations of independent variables and outcome variables. Variables with  $p$ -values  $\leq 0.2$  in bivariate analysis were retained in the model as potential confounders for multivariable analysis. Hosmer and Lemeshow’s goodness-of-fit test was performed to assess whether the required assumption was fulfilled and variance inflation factors were low ( $<10$ ) for the multi-collinearity check. An adjusted odds ratio with 95% confidence intervals and a  $p$ -value less than 0.05 were considered a statistically significant association with the women’s knowledge of cervical cancer.

## Results

### Socio-Demographic Characteristics of Respondents

Out of 1240 participants approached, 1181 of them responded to our study making a 95.2% response rate.

The majority of the respondents were; married 948 (80.3%), Muslims 702 (59.4%) and Oromo ethnic group 706 (59.8%). The mean age of the respondents was 32.50 (SD  $\pm 6.35$ ) years. The greater proportion (398, 33.7%) of the respondents were unable to read and write, followed by those who attended primary education (382, 32.3%). More than two-thirds of study participants (821, 69.5%) were from urban areas while 360 (30.5%) were from rural areas (Table 1).

### Reproductive History of Respondents

The majority of respondents (975, 82.6%) gave birth to a child at least once, and of these two-thirds (645, 66.2%) had 1–3 babies. One-fourth of the respondents (295, 25%) and 347 (29.4%) of their partners had a history of sexual intercourse with more than one person. Ninety-one (7.7%) of the respondents were diagnosed with sexually transmitted infections (STI) while 68 (5.8%) of their partners were ever diagnosed with STI. More than half of the respondents (54.8%) had ever used modern FP methods, and injectable (264, 41%) and implants (248, 38.3%) were the commonly used methods. The study participants used FP methods for a mean duration of 33.85 months (Table 2).

### Women’s Knowledge of Cervical Cancer

Five hundred and seventy-four (48.6%) of the study participants have ever heard about cervical cancer. The majority of them heard about the disease for the first time from mass media (radio and television) whereas one-fourth of them (148, 25.8%) got the information from healthcare professionals. Among respondents who heard about cervical cancer, 139 (24.2%) did not know any risk factors, 65 (11.3%) knew at least one risk factor and 139 (24.2%) answered all risk factors associated with cervical cancer. On the other hand, 415 (72.3%) of respondents mentioned having multiple sexual partners is a risk factor for acquiring cervical cancer. The greater proportion (267, 46.5%) of respondents did not know whether family history could be a risk factor for acquiring cervical cancer (Table 3).

The majority of the study participants (83.3%) knew at least one symptom associated with cervical cancer. About 108 (18.8%) respondents answered all of the symptoms mentioned in the questionnaire while 16.7% of the respondents did not know any of the listed symptoms. The majority of the respondents mentioned bleeding after intercourse (329, 57.4%) and irregular menstrual bleeding

**Table 1** Socio-Demographic Characteristics of Respondents at HFSUH and Jugal Hospital, January 1 to May 30, 2019

Variables (N = 1181)	Category	Frequency	Percentage (%)
Age	25–29	625	52.9
	30–34	241	20.4
	35–39	199	16.9
	40–49	116	9.8
Marital status	Married	948	80.3
	Single	101	8.6
	Divorced	93	7.9
	Widowed	39	3.3
Religion	Muslim	702	59.4
	Orthodox	372	31.5
	Protestant	99	8.4
	Others	8	0.7
Ethnicity	Oromo	706	59.8
	Amhara	335	28.4
	Harari	78	6.6
	Tigray	11	0.9
	Others	51	4.3
Occupation	Housewife	573	48.5
	Self-employees	186	15.7
	Government employees	202	17.1
	Daily labourer	46	3.9
	Merchant	123	10.4
	Others	51	4.3
Educational status	Unable to read and write	398	33.7
	Primary education (1–8)	382	32.3
	Secondary education (9–10 +2)	234	19.8
	12 complete and above	167	14.1
Residence	Urban	821	69.5
	Rural	360	30.5

(331, 57.7%) as the symptoms of cervical cancer. About 326 (56.8%) of the study participants knew that a woman can have cervical cancer without manifesting symptoms (Table 3). Sixty per cent of study participants knew a precancerous cervical lesion screening service is available in Harar city. Overall knowledge assessment revealed, out of those who heard about cervical cancer, 288 (55.7%) of study participants had adequate knowledge about cervical cancer (Figure 1).

**Table 2** Reproductive History of Participants of Respondents at HFSUH and Jugal Hospital, January 1 to May 30, 2019

Variables (N = 1181)	Category	Frequency	Percentage (%)
Ever delivered baby	Yes	975	82.6
	No	206	17.4
Number of deliveries	1–3	645	66.2
	4–7	277	28.4
	8 and above	53	5.4
Number of alive babies	0–3	706	72.4
	4–7	236	24.2
	8 and above	33	3.4
History of multiple sexual partners	Yes	295	25.0
	No	886	75.0
History of partner's multiple sexual partners	Yes	347	29.4
	No	834	70.6
Ever diagnosed with STI	Yes	91	7.7
	No	1090	92.3
Ever used modern FP methods	Yes	647	54.8
	No	534	45.2

## Factors Associated with Women's Knowledge of Cervical Cancer

Table 4 summarizes bivariate logistic regression analysis of socio-demographic and other characteristics of study participants that associated with women's knowledge of cervical cancer. Among those variables, older age, increased educational status, being an employee, living in an urban area, previously not using family planning methods and receiving information about cervical cancer from health professionals were positively associated with women's cervical cancer knowledge during bivariate analysis (Table 4). However, during multivariable analysis only women's age, educational status and sources of information had a statistically significant positive association. The study participants whose age was 40–49 years had increased odds of adequate knowledge about cervical cancer compared to the age group 25–29 years (AOR: 2.58, 95% CI 1.99–5.57). Women who have attended primary level education (AOR: 7.07, 95% CI 3.13–15.95), secondary education (AOR: 7.20, 95% CI 2.95–17.59) and attained education level above 12<sup>th</sup> grade (AOR: 12.11, 95% CI 4.57–32.09) have increased odds of adequate

**Table 3** Identified Risk Factors, Symptoms and Prevention Methods of Cervical Cancer by Respondents at HFSUH and Jugal Hospital, January 1 to May 30, 2019

Variables (N = 1181)	Yes (%)	No (%)	I Do Not Know (%)
Having multiple sexual partner is a risk for cervical cancer	415 (72.3)	10 (1.7)	149 (26)
Sexually transmitted infections are a risk for cervical cancer	353 (61.5)	59(10.3)	162 (28.2)
Early initiation of sex can be a risk for cervical cancer	305 (53.1)	71 (12.4)	198 (34.5)
Family history of abnormal cervical lesion is a risk for cervical cancer	167 (29.1)	140 (24.4)	267 (46.5)
Irregular menstrual bleeding is a symptom of cervical cancer	331 (57.7)	51 (8.9)	192 (33.4)
Bleeding after sexual intercourse is a symptom of cervical cancer	329 (57.4)	64 (11.1)	181 (31.5)
Weight loss is a symptom of cervical cancer	227 (39.5)	101 (17.6)	246 (42.9)
Difficulty in passing urine is a symptom of cervical cancer	252 (43.9)	92 (16.0)	230 (40.1)
Blood-stained vaginal discharge is a symptom of cervical cancer	303 (52.8)	49 (4.1)	222 (38.7)
A woman can have cervical cancer without manifesting symptoms	326 (56.8)	93 (16.2)	155 (27.0)
Cervical cancer is a killer if not detected early	478 (83.3)	16 (2.8)	80 (13.9)
Screening can prevent advanced cervical cancer	372 (87.9)	21 (5.0)	30 (7.1)
All females aged 30–49 years should be screened at least once	284 (67.1)	38 (9.0)	101 (23.9)
Cervical cancer screening services are available in Harar	255 (60.3)	5 (1.2)	163 (38.5)

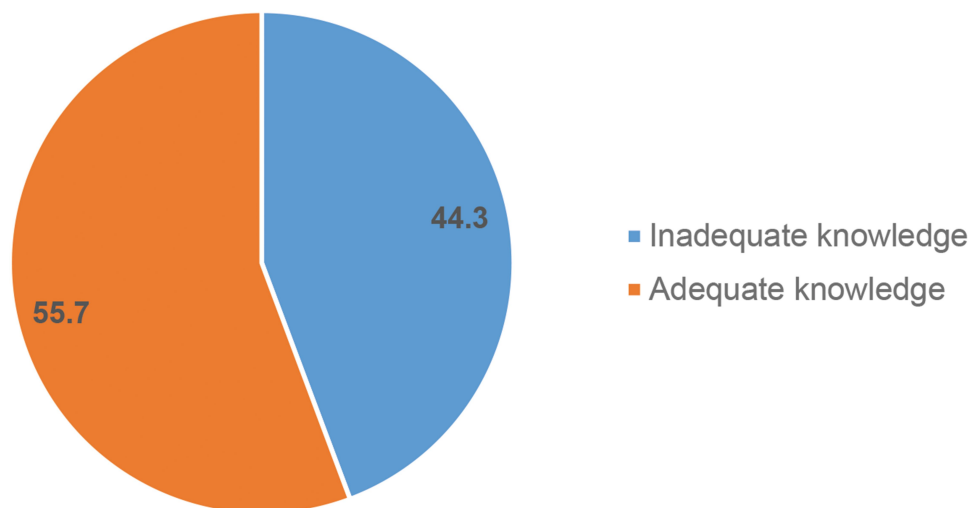
knowledge compared to uneducated women. In addition, there is increased odds of having adequate cervical cancer knowledge among study participants who got information about the disease from healthcare professionals compared to those who got information from mass media (AOR: 2.72, 95% CI 1.69–4.37) (Table 5).

## Discussion

This study measured knowledge and factors associated with cervical cancer among women attending two public health facilities in eastern Ethiopia. In the current study nearly half of the study participants have ever heard about cervical cancer. This result is lower than similar studies from Uganda (99.1%), Kenya (91%) and Bahrain

(65%).<sup>25–27</sup> The variation might be due to the difference in educational level, with more than one-third of study participants in the current study having no formal education. In this study the main source of information about cervical cancer was mass media (radio or TV) followed by health professionals.

In this study a greater proportion of respondents cited multiple sexual partners as a risk factor for cervical cancer. As it is indicated in different studies, individuals who have adequate knowledge often practise preventive methods and utilize care services more than their counterparts.<sup>28</sup> Hence, knowledge of women about cervical cancer is an important and forefront factor to prevent the development of cervical cancer. Similarly, multiple

**Figure 1** Comprehensive knowledge about cervical cancer among respondents at HFSUH and Jugal hospital, January 1 to May 30, 2019.

**Table 4** Bivariate Logistic Regression Analysis of Selected Characteristics of Study Participants and Cervical Cancer Knowledge

Variables (N = 1181)	Knowledge of Cervical Cancer		COR [95% CI]	p value
	Inadequate	Adequate		
<b>Age</b>				
25–29	135 (48.9%)	141 (51.1%)	Ref	
30–34	46 (46%)	54 (54%)	1.12 [0.71–1.78]	0.618
35–39	34 (35.8%)	61 (64.2%)	1.72 [1.06–2.78]	0.028
40–49	14 (30.4%)	32 (69.6%)	2.19 [1.12–4.28]	0.022
<b>Marital status</b>				
Married	172 (44.4%)	215 (55.6%)	0.83 [0.49–1.42]	0.504
Widowed	7 (41.2%)	10 (58.8%)	0.95 [0.32–2.82]	0.930
Divorced	24 (50.0%)	24 (50.0%)	0.68 [0.31–1.42]	0.291
Single	26 (40%)	39 (60%)	Ref	
<b>Educational status</b>				
Unable to read and write	52 (83.9%)	10 (16.1%)	Ref	
Elementary level	83 (43.7%)	107 (56.3%)	6.7 [3.21–13.98]	0.001
Secondary education	64 (41.6%)	90 (58.4%)	7.31 [3.46–15.46]	0.001
12 complete and above	30 (27%)	81 (73%)	14.04 [6.33–31.12]	0.001
<b>Occupation</b>				
Housewife	86 (51.8%)	80 (48.2%)	Ref	
Employee	76 (34.7%)	143 (65.3%)	2.02 [1.34–3.05]	0.01
Daily labourer	15 (65.2%)	8 (34.8%)	0.57 [0.23–1.43]	0.231
Merchant	41 (51.9%)	38 (48.1%)	0.99 [0.58–1.70]	0.989
Others	11 (36.7%)	19 (63.3%)	1.86 [0.83–4.14]	0.131
<b>Income</b>				
<1500	40 (47.1%)	45 (52.9%)	0.61 [0.33–1.12]	0.210
1500–5000	157 (46.0%)	184 (54.0%)	0.64 [0.39–1.03]	0.564
>5000	32 (35.2%)	59 (64.8%)	Ref	
<b>Residence</b>				
Rural	24 (66.3%)	12 (33.7%)	Ref	
Urban	205 (42.6%)	276 (57.4%)	2.69 [1.32–5.51]	0.007
<b>Parity</b>				
<2	105 (43.6%)	136 (56.4%)	Ref	
2–5	77 (50.7%)	75 (49.3%)	0.75 [0.50–1.13]	0.270
>5	7 (33.3%)	14 (66.7%)	1.54 [0.60–3.96]	0.366
<b>HIV status</b>				
Negative	163 (43.0%)	216 (57.0%)	1.26 [0.78–2.04]	0.348
Positive	39 (48.8%)	41 (51.2%)	Ref	
<b>Family planning use</b>				
No	64 (37.9%)	105 (62.1%)	Ref	
Yes	165 (47.4%)	183 (52.6%)	1.48 [1.02–2.15]	0.04
<b>Source of information</b>				
Mass media	157 (49.1%)	163 (50.9%)	Ref	
Health professionals	44 (30.8%)	99 (69.2%)	2.17 [1.43–3.29]	0.001
Friends/neighbour	28 (51.9%)	26 (48.1%)	0.89 [0.50–1.59]	0.705

**Table 5** Multivariate Logistic Regression Analysis of Selected Characteristics of Study Participants and Cervical Cancer Knowledge

Variables	Knowledge of Cervical Cancer		AOR [95% CI]	p value
	Inadequate	Adequate		
<b>Age</b>				
25–29	135 (48.9%)	141 (51.1%)	Ref	
30–34	46 (46%)	54 (54%)	1.16 [0.70–1.93]	0.562
35–39	34 (35.8%)	61 (64.2%)	1.77 [1.03–3.02]	0.038
40–49	14 (30.4%)	32 (69.6%)	2.58 [1.99–5.57]	0.015
<b>Educational status</b>				
Unable to read and write	52 (83.9%)	10 (16.1%)	Ref	
Elementary level	83 (43.7%)	107 (56.3%)	7.07 [3.13–15.95]	0.001
Secondary education	64 (41.6%)	90 (58.4%)	7.20 [2.95–17.59]	0.001
12 complete and above	30 (27%)	81 (73%)	12.11 [4.57–32.09]	0.001
<b>Occupation</b>				
Housewife	86 (51.8%)	80 (48.2%)	Ref	
Employee	76 (34.7%)	143 (65.3%)	1.12 [0.64–1.93]	0.697
Daily labourer	15 (65.2%)	8 (34.8%)	0.52 [0.18–1.51]	0.227
Merchant	41 (51.9%)	38 (48.1%)	0.99 [0.55–1.80]	0.997
Others	11 (36.7%)	19 (63.3%)	1.45 [0.57–3.68]	0.438
<b>Residence</b>				
Rural	24 (66.3%)	12 (33.7%)	Ref	
Urban	205 (42.6%)	276 (57.4%)	1.38 [0.58–3.28]	0.461
<b>Family planning use</b>				
No	64 (37.9%)	105 (62.1%)	Ref	
Yes	165 (47.4%)	183 (52.6%)	0.84 [0.55–1.27]	0.396
<b>Source of information</b>				
Mass media	157 (49.1%)	163 (50.9%)	Ref	
Health professionals	44 (30.8%)	99 (69.2%)	2.72 [1.69–4.37]	0.001
Friends/neighbour	28 (51.9%)	26 (48.1%)	1.00 [0.54–1.86]	0.997

sexual partners is a frequently cited risk factor in the studies from eastern Uganda and Qatar.<sup>29,30</sup>

Knowing the symptoms of cervical cancer helps women to seek healthcare early and get treatment before it gets worse. The majority of respondents in this study mentioned bleeding after sexual intercourse and irregular menstrual cycles as the symptoms of cervical cancer. Similarly, intermenstrual and post-coital bleeding were mentioned as symptoms of cervical cancer in the study done in northern Uganda.<sup>25</sup>

In the present study 55.7% of participants had adequate knowledge about cervical cancer. This finding is in line with the report of the study done in southern Ethiopia.<sup>18</sup> However, it is higher than the reports of a similar study done in western and northern parts of Ethiopia.<sup>12,16</sup> This discrepancy might be due to the majority of participants in

this study being from urban areas who may have a higher opportunity of getting information about cervical cancer from mass media and other sources.

Women's age, educational status and source of information were factors significantly and independently associated with cervical cancer knowledge when adjusted for the effect of other factors in multivariable logistic regression analysis. In the current study, having formal education was positively associated with women's cervical cancer knowledge. As the educational level increases, the odds of having adequate cervical cancer knowledge increases among the study population. This finding is in accordance with other studies done in Ethiopia and other countries.<sup>20,22,31</sup> The increment of knowledge of cervical cancer with educational level indicates educated women have better information-absorbing ability and understanding. This suggests that all women

must get at least access to primary education as this can increase their knowledge about cervical cancer.

In the current study the odds of adequate cervical cancer knowledge was higher among women whose age was between 40 and 49 years. This finding is consistent with the study done in Bhopal, India.<sup>32</sup> This can be explained as younger women usually appear to be healthy and have less frequent contacts with healthcare professionals. This might decrease the chance of young women getting information from healthcare providers, as they are the major source of information for cervical cancer in our study.

Receiving relevant information regarding cervical cancer from healthcare providers has been shown to positively affect knowledge of participants. In this study, women who received information about cervical cancer from healthcare professionals had higher odds of adequate knowledge about cervical cancer. This result is also supported by the finding of a study done in southern California.<sup>33</sup> The information provided by healthcare providers is accurate and correct as compared to other sources of information. In addition, improving the knowledge of women about cervical cancer discussion with healthcare professionals helps to correct misconceptions and rumours about cervical cancer screening.

The limitation of this study is the fact that since the study design was a cross-sectional study, temporal relations could not be established. In addition to this, since it is facility-based study and included participants only from selected health institutions, it does not consider women who did not visit the health facilities. This might affect the representatives of our findings to Harar town. Information (recall) bias and social desirability bias might have also affected our study. Regardless of these limitations, our findings have implications for health professionals, hospital administrations, health offices and policy-makers.

## Conclusion

The knowledge of women towards cervical cancer in our study area was inadequate. Women's age, educational status and source of information were independently associated with cervical cancer knowledge in multivariable logistic regression analysis. Young women with no formal education should get special focus in prevention strategies and we also recommend regular and effective counselling and education about cervical cancer in health institutions.

## Data Sharing Statement

Data can be provided for all interested persons upon request from the principal investigator.

## Ethics Approval and Informed Consent

This study was conducted in accordance with the Declaration of Helsinki and it was approved by the Haramaya University institutional health research ethics review committee and the approval number was (COHMS/10.0/2968/18). A letter of cooperation was written from Haramaya University, college of health and medical sciences to both hospitals. The objectives and purposes of the studies, as well as risks and benefits were explained to the participants according to the level of their understanding. Participants were informed that participation in the study is voluntary; they have the right to withdraw or refuse to participate in the study at any time. Written and signed informed consent were obtained from each study participant and head of both hospitals prior to interview as it is stated in the participant information sheet. The data collection procedure was anonymous in order to keep the confidentiality of any information provided by the study participants.

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## Disclosure

All the authors declare that they have no competing interests in this work.

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