





Determinants of Cervical Cancer Screening Service Utilization Among HIV-Positive Women Aged 25 Years and Above Attending Adult ART Clinics in Southern Tigray, Ethiopia

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Abstract

Background: Cervical cancer and human immunodeficiency virus prevention are public health priorities in Ethiopia. Despite cervical cancer being preventable with the Human Papilloma Virus vaccine and cervical cancer screening, HIV-infected women still have a low rate of screening, and data are scarce in this country. Thus, this study aimed to assess the prevalence of cervical cancer screening service utilization and associated factors among HIV-positive women in Southern Tigray, Ethiopia, 2018.

Methods: A facility-based cross-sectional study was performed from March 1st to May 15th, 2018. We recruited 465 HIV-positive women using a systematic random sampling method. Data were collected using a pre-tested structured interviewer-administered questionnaire. Descriptive statistics, followed by multivariable logistic regression analysis were performed. Crude odds ratios, adjusted odds ratios, and 95% confidence intervals (CIs) were reported.

Results: In this study, only 8% of HIV-positive women were screened for cervical cancer. The most frequently cited barrier by participants to getting screened was feeling healthy 282 (65.9%). Multiparity {AOR = 4.12, 95% CI = (1.70, 9.95)}, provider recommendation to get screened {AOR = 3.20, 95%CI = (1.34, 7.65)}, having good knowledge {AOR = 4.33, 95%CI = (1.66-11.29)}, and high perceived susceptibility for cervical cancer {AOR = 3.10, 95% CI = (1.31-7.33)} were the factors significantly associated with cervical cancer screening service utilization.

Conclusions: The prevalence of cervical cancer screening service utilization was quite low. Provider's recommendation to get screened, multiparity, knowledge, and perceived susceptibility were factors strongly associated with the service utilization. There is a need of routine counseling of health care providers for all HIV-positive women to get screened. Women's lack of knowledge also needs to be addressed by informing every HIV-positive woman that they are more susceptible to cervical cancer, and that screening is critical to fighting against the disease.

Keywords

cervical cancer, cancer screening, HIV-positive, women, Ethiopia

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Introduction

Globally, 570 000 women developed cervical cancer (CC) and 311 365 women have died from the disease, making it the fourth most common cancer for both incidence and mortality among women aged 15–44 years in 2018. However, about 80% of the cases and 87% of the deaths occurred in low-to-middle income countries.^{1,2} In these countries, CC was the second most prevalent and leading cause of cancer death.^{3,4} The highest incidence of CC was documented in Sub Saharan Africa (SSA) at 34.9 per 100 000 women,⁵ and the disease is responsible for 21.7% of all cancer deaths among women in these continents.⁶ Each year, 7095 Ethiopian women are diagnosed with CC, and 4732 die from the disease.^{6,7}

Several studies found that human immunodeficiency virus (HIV)-positive women have a higher burden of CC incidence and mortality than the general population.^{8,9} Immunosuppression and low CD4 count induced by HIV infection predispose HIV-infected women to CC and the development of squamous intraepithelial lesions.^{10,11} Moreover, HIV is associated with several enabling factors for CC, such as multiple sexual partners, early sexual debut, financial status, and smoking.^{11,12} This association between HIV and CC could be more relevant in developing countries, where access to highly active anti-retroviral therapy and other services are still existing challenges.¹³ CC is eight times more common in women living with HIV in this country, and the death rate is 2-fold higher.^{14,15}

Cervical cancer screening programs have an important role in the prevention of CC. The massive decline in CC mortality in developed nations is attributed to widespread screening, but CC in developing nations continues to be the leading female malignancy because cervical cancer screening (CCS) is rare.¹⁶ Ethiopia has adopted cheaper but effective techniques for screening of CC called visual inspection with acetate (VIA)¹⁷ and the federal ministry of health targeted to achieve at least 80% coverage of CCS and treatment among target populations (all women aged 30–49 years) by 2020.¹⁸ However, a nationwide Community-based cross-sectional survey conducted in Ethiopia in 2015 shows an extremely low rate of cervical screening (2.9%).¹⁹ Even though, over 534 000 women were living with HIV in Ethiopia,⁹ only 15 263 of this risky population get screened for CC in the whole country between 2010 and 2013.²⁰ Some recent small-scale studies done in Ethiopia, Gondar,²¹ Addis Ababa^{21,22} among HIV-positive women also reported low rate of screening service utilization (23.5%), (10.8%), and (11.0%), respectively.^{21–23}

According to the study done in Gondar, Southwest Ethiopia in 2017, variables such as age, perceived susceptibility, and knowledge of CC had a strong association with CCS service utilization.²³ A study carried out in 2016 in Addis Ababa, unveiled that the most prevalent barriers to getting screened were a lack of knowledge about CC and CCS, perceived pain during the procedure, and financial constraints.²² Another study done in Addis Ababa, Ethiopia on HIV-positive patients' acceptance of CCS revealed that higher educational

status, getting information about CC from health professionals, and having awareness of the test were significantly associated with higher acceptance of screening.²¹

To date, only a few studies assessed CCS service utilization and associated factors in Ethiopia, where the prevalence of CC and HIV are high.^{7,24} To the best of our knowledge, despite having started CCS services, evidence on the utilization of the service and associated factors among HIV-positive women are unknown in the entire Tigray region, much alone the research area, since analogous studies have not been done on these vulnerable groups. Further information on HIV-positive women regarding the prevalence of CCS utilization and associated factors is needed for effective program implementation, which aims to reduce the incidence and mortality of the disease. Thus, this study aimed to assess CCS service utilization and associated factors among HIV-positive women in Southern Tigray, Ethiopia.

Materials and Methods

Study Area and Setting

A facility-based cross-sectional study was conducted from March 1st to May 15th, 2018, in public health facilities located in the southern zone of the Tigray region, Southern Ethiopia. Functional health facilities in this zone comprised three general and two primary hospitals, 35 medium- and lower-level private clinics, 27 health centers, and 67 health posts. Only Maichew Generalized Hospital, Korem Generalized Hospital, and Alamata Generalized Hospital provide both CCS and anti-retroviral therapy (ART) services in this zone. The overall prevalence of HIV-AIDS is 2.2%, and there are more than 18 000 women population living with HIV in Southern Tigray. However, only 10 574 (58.7%) HIV-positive women are medically treated in these facilities according to the information gained from respective facility heads.

Population

The study population was comprised of HIV-positive women aged 25 years and older²⁵ who were patients of adult HIV clinics at public health facilities that provide CCS in Southern Tigray for at least 6 months. Women who were critically ill and mentally disabled during the data collection period were excluded from the study. Women who had their uterus removed for a variety of reasons were also excluded from the study since they were not at risk of cervical cancer.

Measurement Variables

Outcome Variable: The outcome variable is the utilization of CCS service within 5 years before the survey regardless of the type of CCS.²⁵

Predictor Variables: The predictor variables were conceptualized based on previous similar studies^{21-23,26-28} and then clustered into four sets of factors: socio-demographic characteristics, medical and reproductive history, knowledge-related, and health belief model factors.

Wealth index: The wealth index of participants was produced from the existing variables (household assets ownership, household characteristics, and access to utilities) from the data set through factor analysis using Principal Component Analysis, and participants were assigned into three groups namely: low, medium, and high wealth index.

Knowledge of cervical cancer: Total knowledge of cervical cancer was assessed using a 5-point knowledge score. A total of 10 questions were used to assess the knowledge of participants; correct answers were scored 1 while incorrect answers were scored 0. Then, women with a summary score of greater than or equal to 5 were categorized as having “good knowledge” and those with a score less than 5 were categorized as having “poor knowledge”.²²

Health belief model constructs Perceived susceptibility, severity, benefits, and barriers were assessed using a three-point Likert Scale (0=disagree, 1=neutral, 2=agree). Then, the mean (for those variables which have been distributed normally) or median (for those variables which have not been distributed normally) was computed and dichotomized into high perceived and low perceived.

Perceived susceptibility: Participants who scored more than or equal to a median of 5 from a total of 5 questions regarding susceptibility to cervical cancer were considered as having “high perceived susceptibility” and those who scored less than 5 were considered as having “low perceived susceptibility”.

Perceived severity: Participants who scored more than or equal to a mean of 5 from a total of 5 questions regarding the severity of cervical cancer were considered as having “high perceived severity” and those who scored less than 5 were considered as having “low perceived severity”.

Perceived benefit: Participants who scored more than or equal to a mean of 4 from a total of 4 questions regarding the benefit of cervical cancer were considered as having “high perceived benefit” and those who scored less than 4 were considered as having “low perceived benefit”.

Perceived barriers: Participants who scored more than or equal to a mean of 10 from a total of 10 questions regarding barriers to cervical cancer were considered as having “high perceived barriers” and those who scored less than 10 were considered as having “low perceived barriers”.

Sample Size and Sampling Procedure

To determine the sample size, a single population proportion formula using Epi Info version 7.2.0.1 was used with the following assumptions: 23.5%,^{4,23} the prevalence of cervical cancer screening service utilization among HIV-positive women, a margin of error of 4%, and a 95% confidence interval. For possible nonresponse, 10% was added and the final

sample size was 475. Of all public health facilities in the southern zone of Tigray, facilities that provide both CCS and ART services (Maichew Generalized Hospital, Alamata Generalized Hospital, and Korem Generalized Hospital) were included.¹⁷ Samples were proportionally allocated to the estimated patient flow during the study period of each selected hospital.

For every woman attending the HIV clinic for a routine follow-up visit, eligibility criteria were checked at the entrance desk and a sequential number was given to each eligible participant according to the arrival order. Using a systematic random sampling technique, every third eligible woman on the list of their order of arrival was selected to participate in this study. This procedure was repeated every day in each HIV clinic and a tag was attached to the cards of participants to prevent repeated enrollments of the same participant.

Source of Data and Data Collection Methods

A structured questionnaire, adapted from previous related studies,^{21-23,26-28} was used. Face-to-face interviews and participant medical record reviews were done. The questionnaire had five subparts: socio-demographic characteristics, medical and reproductive history, knowledge on CC and CCS, health beliefs, and screening practice questions. Item questions were checked for reliability and internal consistency using Cronbach’s alpha coefficients. Knowledge about cervical cancer was measured using ten items with a Cronbach’s alpha of .91; perceived susceptibility and perceived severity of screening were measured using five items for each with Cronbach’s alpha of .89 and .92, respectively. The perceived benefit of CCS was measured using four items with Cronbach’s alpha of .90. Perceived barriers were measured using eight items with a Cronbach’s alpha of .88. The questionnaire was translated into the local language (Tigrigna) and subsequently translated back to English by different language experts to check for internal consistency. Data were collected by six BSc nurses and two supervisors (MSc nurses) who had extensive experience in data collection and supervision.

Data Quality Control

The tool was reviewed by two senior experts and pre-tested on 5% of the sample size, before administration. All required revisions were made to the study tool based on the experts’ comments and the pretest. Experienced enumerators ie, six BSc nurses and two MSc nurses were recruited for data collection and supervision. Three-day intensive training on the aim of the study and sampling procedures was provided to the enumerators. An overview of the study and random selection were explained to eligible women and data was collected in a private setting after addressing all doubts and concerns. Supervisors conducted routine checkups on completed questionnaires for completeness

and scientific soundness. Additionally, the principal investigator checked the filled questionnaire and provided feedback to the supervisors daily. Before commencing the data analysis, appropriate transformations were made to the variables.

Data Processing and Analysis

The data were entered into Epi-data version 3.1.1 and then transferred to SPSS version 25 for analysis. Frequency and percentage distribution were used to describe the characteristics of the overall sample respondents across a set of background characteristics. Bivariable and multivariable logistic regression analyses were also performed. Simple summary statistics (percentage of the outcome variables) were obtained for each category of the explanatory variables to examine the unadjusted but statistically significant relationship between the dependent variable and explanatory variables. The statistical significance was tested by a Pearson's χ^2 (chi-square) test. Age was controlled for in the bivariable analysis. After adjusted for age, variables that remained significant with a *P*-value of less than .05 were retained for further analysis with multivariable logistic regression to control for confounders. Odds ratios and 95% confidence intervals were computed and a *P*-value of less than .05 was used to determine the cut-off points for statistical significance. The necessary assumption of model fitness during logistic regression was checked using Hosmer -Lemeshow goodness-of-fit test statistics. Multicollinearity was checked by a variable inflation factor and all showed no multicollinearity with a variable inflation factor of less than five.

Results

Socio-Demographic Characteristics of Participants

From a total of 475 age-eligible women, 465 women participated in this study, with a response rate of 97.9%. The mean age \pm SD of participants was 31.61 ± 8.81 . More than half of the participants were married 277 (59.6%), attended at least primary education 279 (60.0%), employed 290 (62.4%), and lived in urban 255 (54.8%). A large proportion of participants 186 (40.0%) belonged to the high wealth index group (Table 1).

Reproductive and Medical Characteristics of Participants

The mean age \pm SD at first sexual intercourse was 17.70 ± 2.98 . Of all the study participants 303 (65.2%) claimed that they did not have multiple sexual partners, 319 (68.6%) claimed that their partner or husband did not support them in checking their gynecological health, and 330 (71.0%) claimed to have ever used modern contraceptives. Only 178 (38.3%) participants admitted to having a history of sexually transmitted diseases (STIs).

A medical review report revealed that more than half of 255 (54.8%) respondents were diagnosed with HIV ≥ 5 years before the study period. The mean \pm SD of CD4 count was (382 ± 24 cells/mm³) whereas 190 (40.7%) women were found in stage 2 (mildly symptomatic stage such as unexplained weight loss of less than 10% body weight and recurrent respiratory infections) according to the World Health Organization clinical stage. Only 110 (23.7%) respondents claimed that they had ever undergone a gynecological exam for various reasons, and 18 (3.7%) claimed they had a family history of CC (Table 2).

Table 1. Socio-demographic Characteristics of HIV-positive Women Aged 25 Years and Above Attending Adult HIV Clinics in Southern Tigray, Ethiopia 2018 (N = 465).

Variable	Category	Total (N) and percentage (%)
Age	25-34	182 (39.1)
	35-44	189 (40.7)
	≥ 45	94 (20.2)
Mean age \pm SD:31.61 \pm 8.81		
Marital status	Married	277 (59.6)
	Single	188 (40.4)
Educational status	No formal education	186 (40.0)
	Primary education	117 (25.2)
	Secondary education	96 (20.6)
	College and above	66 (14.2)
Occupational status	House-wife	175 (37.6)
	Self-employed	202 (43.4)
	Governmental employed	88 (19.0)
Wealth index	Low	130 (28.0)
	Medium	149 (32.0)
	High	186 (40.0)
Place of residence	Urban	255 (54.8)
	Rural	210 (45.2)

SD = Standard Deviation.

Information and Knowledge Related to CC and CCS Service

In this study, 339 (72.9%) had heard of CC and CCS. Of these, a large proportion heard from health professionals 186 (54.9%). Of all the respondents, only 110 (23.7%) had good knowledge of symptoms of CC, 160 (34.4%) had good knowledge about risk factors for CC, and 140 (30.1%) had good knowledge about prevention methods for CC. While

153 (32.9%) knew that having HIV is risky for CC, 250 (53.8%) knew that CC is a killer if not detected early, and 194 (41.7%) knew that CC is curable if treated in its earliest stage (Table 3).

Perceptions and Utilization of CCS

About 129 (27.7%), 180 (38.7%), and 162 (34.8%) HIV-positive women had high a perceived susceptibility to CC, a

Table 2. Reproductive and Medical Characteristics of HIV-positive Women Aged 25 Years and Above Attending Adult HIV Clinics in Southern Tigray, Ethiopia 2018 (N = 465).

Variable	Total (N) and percentage (%)
Age at first sexual experience <18	274 (58.9)
Mean age at first sex \pm SD: 17.70 \pm 2.979	
Having multiple sexual partners	162 (34.8)
Ever use combined oral contraceptive pills	330 (71.0)
Having partner/husband support	146 (31.4)
Having a history of STI	178 (38.3)
Ever use a condom during sex	134 (28.8)
Given birth at least once	319 (68.6)
Having \geq 5 children	97 (20.9)
Diagnosed for HIV for \geq 5 years	164 (36.3)
CD4 count (cell/mm ³) < 500	314 (67.5)
Mean CD4 count (cell/mm ³) \pm SD = 382 \pm 243	
WHO HIV clinical stage one	150 (32.2)
WHO HIV clinical stage two	190 (40.9)
WHO HIV clinical stage three	79 (17.0)
WHO HIV clinical stage four	46 (9.9)
Having a family history of cervical cancer	18 (3.9)
Recommended by a provider for cervical cancer screening	165 (35.5)
Ever had a gynecological exam for different reasons	110 (23.7)

CD4 = Cluster of Differentiation 4; HIV = Human Immunodeficiency Virus; mm³ = Cubic Millimeter; SD = Standard Deviation; STI = Sexually Transmitted Infection; WHO = World Health Organization.

Table 3. Information and Knowledge Related to CC and CCS service among HIV-positive Women Aged 25 Years and Above Attending Adult HIV Clinics in Southern Tigray, Ethiopia 2018 (N = 465).

Variables	Total (N) and percentage (%)
Ever heard about cervical cancer and cervical cancer screening	339 (72.9)
Health professionals as the main source of information	186 (54.9)
Mass media as the main source of information	120 (35.4)
Friends/relatives/neighbors as the main source of information	33 (9.7)
Having good knowledge about symptoms of cervical cancer	110 (23.7)
Having good knowledge about risk factors for cervical cancer	160 (34.4)
Having good knowledge about prevention methods for cervical cancer	140 (30.1)
Cervical cancer dysplasia can happen without any symptoms	142 (30.5)
HIV increases the risk of CC	153 (32.9)
Cervical cancer is a killer if not detected early	250 (53.8)
Cervical cancer is curable if treated in its earliest stage	194 (41.7)
CCS prevents the development of advanced CC	210 (45.2)
Precancerous CCS in the respective hospital	150 (32.3)
Having total good knowledge about CC and CCS	179 (38.5)

CC = Cervical Cancer; CCS = Cervical Cancer Screening; HIV = Human Immunodeficiency Virus.

high perceived benefit of CCS, and high perceived barriers to CCS, respectively (Table 4).

More than half 265 (57.0%) of women had a high perceived severity of the disease. In this study, merely 37 (8.0%) HIV-positive women were screened within the last 5 years preceding the survey. Concerning reasons cited by participants for not being screened, the perception of being healthy was mentioned by a significant number of women (282) followed by embarrassment (200) (Figure 1 jpg).

Percentage Variation in the Prevalence of CCS Service Utilization

Regarding the CCS service utilization percentage variation across a set of some selected variables in Table 4, participants who fell within the age range of (25-34) and (35-44) were more likely to utilize CCS service (11.0%) and (6.9%), respectively than those who found in their age of ≥ 45 years (4.3%). Participants who belonged to the high wealth index

group were more likely to utilize CCS service (16.6%) than those who belonged to the low wealth index group (3.8%). However, participants who belonged to the medium wealth index group were less likely to utilize the service (3.3%) compared to those who belonged to the low wealth index group (3.8%).

Participants with a history of STI had a higher percentage of CCS service utilization (15.2%) than their counterparts (3.5%). Multipara women were more likely to utilize the service (19.6%) than those who had < 5 children (4.9%). In addition, respondents who had been diagnosed with HIV for more than 5 years were more likely to utilize CCS service (13.4%) than those who had been diagnosed with HIV for less than 5 years (5.0%). Participants who had been recommended by a health provider for CCS were more likely to use CCS service (15.8%) than their counterparts (3.7%). participants who had good total knowledge about CC and CCS were more likely to utilize CCS service (16.2%) than those participants who had poor total knowledge about CC and CCS (2.8%).

Table 4. Participants Perception (Constructs of Health Belief Model) and CCS Service Utilization among HIV-positive Women Aged 25 Years and Above Attending Adult HIV Clinics in Southern Tigray, Ethiopia 2018 (N = 465).

Variables	Total (N) and percentage (%)
High perceived susceptibility to cervical cancer	129 (27.7)
High perceived severity of CC	265 (57.0)
High perceived benefit of CCS	180 (38.7)
High perceived barriers to cervical cancer	162 (34.8)
CCS service utilization within 5 years	37 (8.0)

CC = Cervical Cancer; CCS = Cervical Cancer Screening.

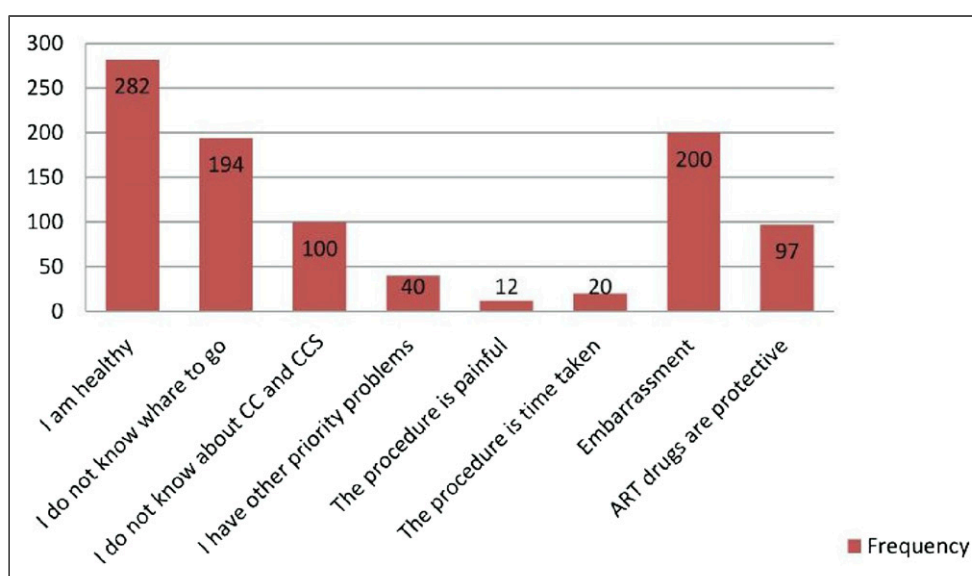


Figure 1. Reasons cited by participants for not being screened among HIV-positive women aged 25 years and above attending adult HIV Clinics in Southern Tigray, Ethiopia 2018 (N = 428).

Additionally, participants who had high perceived susceptibility for CC were more likely to use CCS service (18.6%) than those who perceived low (3.9%) (Table 5).

Factors Associated With CCS Service Utilization

After adjusting for age, variables such as wealth index, provider recommendation for CCS, parity, having a history of STI, duration of HIV diagnosis, knowledge about CC and

CCS, and perceived susceptibility remained significant in the bivariable logistic regression. Results of multivariable logistic regression indicated that multiparty {AOR: 4.12; 95% CI: (1.70, 9.95)}, being recommended by provider for CCS {AOR: 3.2; 95% CI: (1.34, 7.65)}, having good knowledge about CC and CCS {AOR: 4.33; 95% CI: (1.66, 11.29)} and high perceived susceptibility {AOR: 3.10, 95% CI: (1.31, 7.33)} showed a significant association with cervical cancer screening service utilization (Table 6).

Table 5. Prevalence of Cervical Cancer Screening Service Utilization, Stratified by Selected Participant's Characteristics and Unadjusted but Significant Association of Dependent and Explanatory Variables.

Variable	Category	Prevalence of screening 37 (8.0%)	P-value
Age	25-34	20 (11.0)	.11
	35-44	13 (6.9)	
	≥45	4 (4.3)	
Wealth index	Low	5 (3.9)	.01
	Medium	5 (3.4)	
	High	27 (14.5)	
History of STI	Yes	27 (15.2)	.01
	No	10 (3.5)	
Parity	<5 children	18 (4.9)	.00
	≥5 children	19 (19.6)	
Diagnosis for HIV	<5 years	15 (5.0)	.01
	≥5 years	22 (13.4)	
Total knowledge about CC and CCS	Good knowledge	29 (16.2)	.00
	Poor knowledge	8 (2.8)	
Perceived susceptibility	High perceived	24 (18.6)	.00
	Low perceived	13 (3.9)	

*P-value: Indicated the unadjusted but statistically significant relationship between the dependent variable and explanatory variables (not adjusted for age) obtained after being tested by the χ^2 (chi-square) test.

Table 6. Results of Age-Adjusted Logistic Regression Analysis on Factors Associated with CCS Service Utilization (N = 465).

Variables	Category	Screening		COR	AOR
		No	Yes		
Age	25-34	162	20	RC	RC
	35-44	176	13	.60 (.29, 1.24)	.94 (.36, 2.48)
	≥45	90	4	.36 (.12, 1.09)	1.87 (.43, 8.12)
Wealth index	Low	125	5	RC	RC
	Medium	144	5	.86 (.80, 9.24)	.44 (.10, 1.90)
	High	159	27	4.27 (1.52, 12.01)**	1.28 (.38, 4.31)
Having a history of STI	No	277	10	RC	RC
	Yes	151	27	4.95 (1.15, 21.29)*	1.40 (.53, 3.71)
Parity	<5	350	18	RC	RC
	≥5	78	19	4.74 (1.88, 11.95)**	4.12 (1.70, 9.95)**
Diagnosis for HIV	<5 years	286	15	RC	RC
	≥5 years	142	22	2.95 (2.68, 3.26)**	.89 (.38, 2.10)
Provider recommendation for CCS	No	289	11	RC	RC
	Yes	139	26	4.91 (3.22, 7.50)***	3.20 (1.34, 7.65)**
Knowledge about CC and CCS	Poor knowledge	278	8	RC	RC
	Good knowledge	150	29	6.72 (3.18, 21.59)*	4.33 (1.66, 11.29)**
Perceived susceptibility	Low perceived	323	13	RC	RC
	High perceived	105	24	5.68 (3.91, 8.25)***	3.10 (1.31, 7.33)*

AOR = Adjusted Odds Ratio; CI = Confidence Interval (95%); COR = Crude Odds Ratio; RC = Reference Category.

*: statistically significant variables with P-value < .05, **: statistically significant variables with P-value < .01, ***: statistically significant variables with P-value < .001.

Discussion

This study aimed to assess the prevalence of cervical cancer screening service utilization and associated factors among HIV-positive women aged 25 years and above attending adult HIV clinics in Southern Tigray, Ethiopia. The prevalence of CCS service utilization was quite low (8.0%). Multiparity, provider recommendation for cervical cancer screening, having good knowledge about CC and CCS, and having high perceived susceptibility for CC were factors associated with CCS service utilization,

In this study, only 37 (8%) of HIV-positive women reported a history of CCS in the last 5 years. This finding was lower than that of previous studies carried out among HIV-positive women in Ethiopia: Gondar (23.5%),²³ Addis Ababa (11.5%),²² and Addis Ababa (10.8%).²¹ This variation can be explained by the differences in the level of knowledge of study participants about CC and CCS. It may also be due to the weak integration of ART follow-up care with CCS services. This figure was also much lower than the findings from the study conducted in Spain among 479 HIV-positive women (50.6%),²⁹ the study carried out in England among 209 low-income women living with HIV (85.7%),³⁰ a mixed study conducted in Kenya among 378 HIV-positive women (46%).³¹ The possible reason for this variation could be due to the variations in the universal access to the health service as well as the countries' promotional policy variations. Kenya, for example, has a more robust CCS program with other prevention services as well as ongoing provision of health education about cervical cancer and screening services.³²

Furthermore, the prevalence of CCS service utilization in the current study is also lower than in prior studies among the general women population conducted in different locations in Ethiopia, such as Dessie (11.0%),²⁶ Mekelle (19.8%),²⁷ and Jimma (15.5%).³³ This could be explained by the fact that as the previous studies were done in large cities, with individuals more likely to be urban and have more access to media and other information that can enable them to utilize the service. On the other hand, the finding from the current study is higher than the previous studies conducted among married women in Arbaminch among married women (5.9%)²⁹ and Dire Dawa among all women aged 30-49 (4.0%).³⁴ This might be because of the integration of ART to CCS service, which has a potential to enhance the utilization among HIV-positive women.

The perception of being healthy due to the absence of symptoms was the most frequently cited barrier to getting screened by the study participants 282 (65.9%). The same result was also reported in the studies conducted in Gondar²³ and Addis Ababa,²¹ which revealed that the absence of symptoms/discomfort was among the main reasons mentioned by participants for not utilizing the service. This could be explained by the fact that most people seek health care services while they feel unhealthy, especially in developing countries.

In this study, the odds of cervical cancer screening among women with good knowledge were 4.3 times higher than those who had poor knowledge. Consistent findings were also reported in a study conducted in Gondar²³ and Addis Ababa.^{21,22} There is, therefore, a need to increase awareness about cervical cancer and the need of being screened as a measure to prevent cervical cancer.

Recommendation/consultation from health professionals was a strong predictor of CCS uptake. Women who have been recommended by health care providers were more likely to be screened when compared with those who had not been recommended. This finding is in line with studies conducted in Kenya³¹ and Uganda.³⁵ This might be attributed to the consultation/recommendation from health care providers increasing awareness about CC and the importance of screening services.

Participants who have high perceived susceptibility to develop CC were 3.10 times more likely to utilize CCS service as compared to their counterparts. The results of the current study are in line with previous studies conducted in Gondar,²³ Mekelle,²⁷ and Uganda.³⁶ This might be attributed to the assumption of the behavioral model theory, which assumes that individuals who admit a high risk that they will be personally affected by a particular health problem are more likely to engage in behaviors to decrease their risk of developing the condition.³⁷

Furthermore, women with five or more children were nearly four times more likely to be screened than women with less than five children. This finding was similar to that of a previous study conducted in Arbaminch.²⁸ This could be because women who had many children might visit health care facilities more frequently in addition to their routine HIV care follow-up than those with few children. As a result, they might have the opportunity to get information and advice to use the screening service from health professionals.

Strength and Limitation of the Study

The health belief model was utilized in this study to examine the behaviors of participants. Another aspect of the study is that it is controlled for potential confounders. The limitation of this study is the difficulty in interpreting the findings from a cause-and-effect relationship, as the study was cross-sectional. The recall period of screening service utilization of up to 5 years may increase recall bias in this study, and participants may have inflated or underestimated their screening prevalence. Since the study is facility-based, it may not represent all women not visited health institutions during the study period. Despite training being given for data collectors and the purpose of the study being discussed with participants, the study may still be liable to social desirability bias, especially while we assessed the behavioral characteristics of participants. Health belief model questions were also better if supported by a qualitative approach.

Clinical and Public Health Implications

The evidence from this study suggested that public health policies aimed at increasing cervical cancer screening service utilization better target risky groups discovered in our study such as; non-multipara women, women having low perceived susceptibility & poor knowledge. All HIV-positive women, especially those in high-risk categories identified by our study, require a well-established community sensitization and awareness-building activities. Initiatives for health education should focus on spreading awareness about cervical cancer's asymptomatic nature and HIV-positive women's highest risk of the disease.

The current study documented the issue of failure to utilize CCS service also attributed to provider's recommendation for ART patients to get screened. Higher intentions to the screen have been documented among women who reported discussions on CC with health care providers.^{38,39} The opportunity presented is that health care providers can be used as an effective intervention to increase the utilization of screening services among HIV-positive women. CCS should therefore form part of the discussion between health workers and HIV-positive women when they go to seek health care. This could take the form of asking patients whether they have ever been screened during routine visits, providing them with more information and support, and recommending them to access cervical cancer screening services. Consequently, effective screening intervention and implementation approaches are warranted if the full benefits of screening and the risk of acquiring the disease are to be recognized.

Conclusion

The prevalence of screening uptake among HIV-positive women was too low. The common reason provided by participants after being asked why they did not get screened was feeling healthy, preceded by embarrassment. Having good knowledge, high perceived susceptibility, being recommended by health care providers to be screened, and multiparity were factors positively associated with CCS utilization in this study.

Abbreviations

AOR	Adjusted Odds Ratio
ART	Anti-Retro Viral Therapy
CC	Cervical Cancer
CCS	Cervical Cancer Screening
CD4	Cluster of Differentiation 4
CI	Confidence Interval
COR	Crude Odds Ratio
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
SPSS	Statistical Package for Social Science
STI	Sexually Transmitted Infection

WHO World Health Organization
VIA Visual Inspection with Acetate

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Author Contributions

All the data of this study are available from the corresponding author upon request. All authors contributed equally to this work. LG, MH, TT, TS, MG, and TB contributed to the study concept, design, acquisition of data, contributed to analysis, and interpretation of data. LG and TB contributed to the draft of the manuscript. All authors read and approved the manuscript.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical Approval and Consent to Participate

Ethical approval was obtained from Addis Ababa University College of the Health Science Department of Nursing and Midwifery Institutional Review Board of the research committee (approval no. ERC/052/2017) and the official letter of cooperation was written to the respective health facility heads. Permission letters were obtained from the respective health facility heads. Written informed consent was obtained from all study subjects before interviewing. No personal details were recorded or produced on any documentation related to the study participants and punctuality was assured.

Availability of Data

The data sets used and/or analyzed during this study are available from the corresponding author upon request.

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Supplemental Material

Supplemental material for this article is available online.

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