

Role of awareness on cervical cancer screening uptake among HIV positive women in Addis Ababa, Ethiopia: A cross-sectional study

Kassahun Emru¹, Tsega-Ab Abebaw²
and Admas Abera³ 

Abstract

Background: Cervical cancer is the second commonest cancer among women living in less developed countries. Although cervical cancer screening for HIV-infected women has been started in different centers in Addis Ababa, there is a paucity of data on the uptake of this service, particularly among HIV-infected women.

Objective: This study is aimed to assess the level and determinants of cervical cancer screening uptake among HIV-positive reproductive-age women in Addis Ababa, Ethiopia.

Methods: A cross-sectional study was conducted using a structured questionnaire on 411 HIV-infected women aged 15–49 years in St. Paul's and Zewditu Hospitals. Data were collected using a pre-tested structured questionnaire on randomly selected study participants' proportional allocation in the two hospitals. Logistic regression analyses were used to assess predictors of cervical cancer screening uptake.

Results: Only 25.5% of HIV-positive reproductive-age women have been screened for cervical cancer. Respondents who have not heard about cervical cancer and the screening were 75% and 78% less likely to be screened compared to their counterparts, respectively.

Conclusion: The uptake of cervical cancer screening was low in the study area. Awareness about cervical cancer screening was positively associated with cervical cancer screening uptake. Specific awareness programs focusing HIV positive women need to be implemented.

Keywords

awareness, cervical cancer, HIV, low-resource settings, screening, women

Date received: 2 March 2021; revised: 22 April 2021; accepted: 22 April 2021

Background

Cervical cancer is primarily ascribed to persistent infection with a high-risk oncogenic human papillomavirus.¹ Globally, more than 2.7 million women are at risk of cervical cancer,² and it is the fourth most common cancer globally and the second among women living in less developed countries³ with an estimated 445,000 new cases in 2012.⁴

Women who are infected with the Human Immunodeficiency Virus (HIV) are at increased risk of human papillomavirus infection, cervical cancer, and pre-cancerous lesions compared with uninfected women.^{5–7} Cervical cancer is about eight times more prevalent in

HIV-infected women than uninfected ones,⁸ and the risk of developing invasive cervical cancer in HIV-infected women is 10 years earlier.⁷ In sub-Saharan Africa, women living

¹Institution for Healthcare Improvement, Quality Assurance Office, Addis Ababa, Ethiopia

²School of Medicine, Adama Hospital Medical College, Adama, Ethiopia

³School of Public Health, College of Health and Medical Sciences, Haramaya University, Harar, Ethiopia

Corresponding author:

Admas Abera, School of public health, College of Health and Medical Sciences, Haramaya University, P.O. Box 235, Harar, Ethiopia.
Email: admasabera10@gmail.com



with HIV infection comprise 60% of the 34.8 new cases of cervical cancer per 100,000 women annually.⁹

In Ethiopia, cervical cancer is the second most common cause of cancer morbidity and mortality. The 2012 estimate showed that the age-standardized incidence rates of cervical cancer in Ethiopia were 26.4 cases per 100,000 women. About 4732 cervical cancer deaths occurred annually and the age-standardized mortality rate was 18.4/100,000.¹⁰ Further, one study in South Ethiopia indicated that nearly a quarter (22.1%) of HIV-infected women was positive for precancerous cervical cancer.¹¹

Before progression to invasive disease, cervical cancer has a long pre-invasive phase, enabling detection of precancerous changes by screening. Screening is an important control and prevention strategy, recommended by the World Health Organization (WHO) for the age 30 years and above women, and beginning even earlier for some high-risk women such as women living with HIV, or with a history of early sexual intercourse.¹²

Cervical cancer is the only gynecologic cancer for which screening test is available that can detect its precancerous stage¹² which makes it one of the most preventable cancers due to its slow progression, identifiable cytological precursors, and effective treatment.¹³ Therefore, integrating cervical cancer prevention within HIV care services will not only decrease the morbidity and mortality linked with invasive cervical cancer but will also improve HIV treatment outcomes.^{14,15}

In line with WHO guidelines, the Ethiopian cervical cancer prevention, and control guidelines recommend starting cervical screening for every woman aged 30 years. If a woman is HIV positive, it recommends starting screening at HIV diagnosis regardless of age once the woman is sexually active.¹⁶ Despite these guidelines, the uptake of cervical screening tests still remains unsatisfactory in Ethiopia. A survey conducted in 2015 indicated the rate of cervical cancer screening to be significantly low (2.9%).¹⁷

The reasons for the low uptake of the program are thought to be affected by multiple barriers including poor knowledge and attitude toward cervical cancer prevention, and poor early detection mechanisms. Therefore, understanding the influence of knowledge on the uptake of the cervical cancer screening program has paramount importance in designing effective strategies particularly among women with HIV/AIDS.

Although cervical cancer screening for HIV-infected women has been started in various centers in Addis Ababa and elsewhere in Ethiopia, data on the uptake of this service and its determinants are insufficient. Therefore, this study is aimed at exploring the impact of knowledge on cervical cancer screening uptake among HIV-positive women in Addis Ababa, Ethiopia.

Methods and materials

Study area and period

The study was conducted at Addis Ababa St. Paul's and Zewditu Hospitals, from 20 April 2015 to 10 May 2015.

Addis Ababa is the capital city of Ethiopia, and it has 10 sub-cities. At the time of this study, there were a total of 13 public hospitals and 80 functional public health centers. The two hospitals were among the facilities selected in Ethiopia to provide cervical cancer screening services for HIV-positive women 2 years before the study period.

Study design

Healthcare institution-based cross-sectional study was conducted to explore cervical screening uptake and its determinants.

Source and study population

All women of reproductive age group (15–49 years) visiting Zewditu and St. Paul's Hospitals for antiretroviral therapy (ART) follow-up and pre-ART were the source population of this study, and those women who were selected using systematic random sampling technique were the study population.

Sample size

The sample size was determined using a single population proportion formula which is stated as, $n = Z^2 p(1 - p)/d^2$ (where “ n ” is the desired sample size, “ Z ” is the value of a standard normal variable at 95% confidence interval (CI), “ p ” is the proportion of cervical cancer screening service uptake: which was assumed to be fifty percent, and “ d ” is the marginal error which was assumed to be 5%). With adding a 10% non-response rate, the final sample size was estimated to be 424.

Sampling procedure

The total numbers of clients who were eligible for the test were estimated using the last quarter report of the two hospitals. Afterward, the samples were allocated proportionally to the estimated size of clients for the study period of each hospital. Accordingly, 201 samples from St. Paul's and 223 from Zewditu Hospitals were taken. Finally, using a systematic random sampling technique, a sampling fraction of every 12th eligible clients from Zewditu and 11th from St. Paul's Hospitals were included in the study. All HIV-positive women in the reproductive age group (15–49 years) enrolled for ART/pre-ART follow-up at Zewditu and St. Paul's Hospitals during the data collection period were included in the study. Those who were newly enrolled during the data collection time were left out.

Measurements and variables

The outcome variable for this study was cervical cancer screening uptake. The independent variables include age, religion, marital status, occupation, income, level of

education, awareness about cervical cancer, and awareness about cervical cancer screening and duration of HIV infection.

Data collection procedures

Data were collected using a pre-tested and structured questionnaire through a face-to-face interview.

Data quality control

The questionnaire was first developed in English and translated to Amharic, and it was again translated back to English. The translation was carried-out by different individuals to control the consistency of the translation. The tool was pre-tested on 5% of the sample size at Black Lion Hospital to look at the accuracy of responses, the clarity of language, and the appropriateness of the tool. Four data collectors and one supervisor were trained for one day about the objectives of the study, data collection methods, and ethical considerations. The completeness and logical consistency of the collected data were checked by the investigators at the data collection site. Data coding, entry, and cleaning were performed by the investigators.

Data management and data analysis

The data were cleaned, coded, and double-entered using Epi Info version 7 which was exported to SPSS version 21 for analysis. Frequencies and summary statistics were used to describe the study population with relevant socio-demographic and economic characteristics. A bivariate logistic regression model for first events was used to explore the association between cervical cancer screening status and the covariates. All variables with a liberal p -value of less than 0.20 in the bivariate logistic regression analysis were taken into the multivariable logistic regression to identify the independent effect of different variables on cervical cancer screening status. A p -value less than 0.05 and an adjusted odds ratio with a 95% CI were used to determine the presence and degree of association.

Ethics approval and consent to participate

Ethical clearance was obtained from the Ethical review committee of Debre Markos University, College of Medicine and Health Sciences with an ethical clearance number of IRERC-819/02/15. Permission was obtained from participating hospitals which was communicated through a formal letter from Addis Ababa Health Bureau. A detailed explanation of the purpose and the nature of the study was given to the responsible officials and ART department assigned health care workers. Informed written consent was obtained from participants after adequate information about the purpose, risk, and benefit of the

study, and their right not to participate or withdraw at any time from the study was provided.

Results

A total of 411 study participants responded to the questionnaire which makes the response rate 97%. Of the total study participants, about a third of the respondents were in each of the age groups, 47.7% were married, 38.4% had completed secondary education, and three-quarters of them (75.7%) were employed. More than half (54.3%) of the respondents lived more than 60 months after they have been diagnosed with HIV infection (Table 1).

Awareness about cervical cancer

Most of the respondents (81.8%) have heard about cervical cancer from which about 90% and 88% of the respondents believed that cervical cancer could be prevented and treated, respectively (Table 2).

Awareness on cervical cancer screening and screening status

From the total respondents, a little more than three quarters (76.1%) had heard about cervical cancer screening. The source of information among those who had heard about the screening was health personnel in the majority of the cases (82.7%). A significant proportion of respondents (16.5%) did not know where the screening service is available while 83.5% responded that it is available in hospitals and clinics.

Although the majority of the respondents had heard about the screening and know where it is available, only 105 (25.5%) of the total respondents had undergone the screening. From the 306 HIV-infected women in this study who were not screened, the reasons mentioned for not taking the screening service were: lack of awareness about the screening (27.1%), fear of positive result (15.7%), fear of painful procedure (14.1%), long waiting time to get the service (1%), has no sign to worry (22%), believe they do not have a disease (10.2%), failed to get partner's approval (5.8%), and the rest 4.1% mentioned different other reasons.

Factors associated with cervical cancer screening uptake

After controlling for confounders in the multivariable logistic regression, awareness of cervical cancer and cervical cancer screening were significantly associated with cervical cancer screening.

Respondents who had not heard about cervical cancer and the screening were 75% (adjusted odds ratio (AOR) = 0.25 (95% CI = 0.08, 0.81)) and 78% (AOR = 0.22 (95% CI = 0.06, 0.60)) less likely to be

Table 1. Socio-demographic characteristics of HIV-positive women attending ART clinic in St. Paul's and Zewditu Hospitals, Addis Ababa, Ethiopia, 2015 ($n = 411$).

Variables	Category	Frequency (411)	%
Age group (in years)	15–34	143	34.8
	35–39	135	32.8
	40–49	133	32.4
Marital status	Single	99	24.1
	Married	196	47.7
	Divorced	62	15.1
	Widowed	54	13.1
Religion	Orthodox	271	65.9
	Muslim	73	17.8
	Protestant	57	13.9
	Catholic	10	2.4
Level of education	Illiterate	87	21.2
	Primary	100	24.3
	Secondary	158	38.4
	Diploma	59	14.4
	Degree and above	7	1.7
Duration after the first diagnosis of HIV infection (in months)	<6	17	4.1
	6–11	38	9.2
	12–23	27	6.6
	24–35	37	9
	36–59	69	16.8
	>60	223	54.3
Employment status	Government	127	30.9
	Private	184	44.8
	Not employed	100	24.3
Income (ETB)	≥600	198	48.2
	<600	213	51.8

screened than those who had heard about cervical cancer and the screening, respectively (Table 3).

Discussion

Cervical cancer is one of the preventable diseases. The main aspects of its prevention include early detection of the premalignant lesion through cervical screening. This study assessed the level and predictors of cervical cancer screening uptake among HIV-positive women in St. Paul's and Zewditu Hospitals, Addis Ababa, Ethiopia. Despite the recent efforts to screen at least 80% of all HIV-positive women in Ethiopia, this study revealed that only a quarter of the respondents had undergone screening for cervical cancer. When compared to other similar studies, the result is comparable to 23.5% in Gondar¹⁸ while higher than 10% in another study conducted in Gondar,¹⁹ 11.5% in Addis Ababa,²⁰ 19% in Kenya²¹ and 9.4% in Nigeria²² and lower than 58% that of Ottawa.²³ According to the Ethiopian guideline for cervical cancer prevention and control's recommendation, the level of cervical cancer screening uptake in this study was very low.

The major reasons mentioned for not being screened in this study were lack of awareness about the screening (27.1%), has no sign to worry (22%), fear of positive result (15.7%), fear of painful procedures (14.1%), and believing not having a disease (10.2%). Similarly, a study conducted in Cameroon revealed the majority of the respondents (25.3%) mentioned lack of awareness as a reason for not being screened while 5.53% believed that they were healthy and saw no need for screening and 4.35% thought it could be painful.²⁴ A study conducted in Nigeria also mentioned lack of awareness as the major reason.²⁵ A systematic review in Uganda also stated fear of the screening procedure or outcome was among the most frequently reported barriers.²⁶ Lack of awareness can halt people from taking preventive action. Therefore, raising awareness about cervical cancer and screening could have an important role to avert most of the reasons mentioned by respondents and the low uptake of the screening.

According to this study, the majority of the respondents (81.8%) had heard about cervical cancer which is comparable with a similar study conducted in Gondar 87.7%¹⁸ and significantly higher than other studies conducted in Gondar (49.6%)¹⁹ and 56.2% in Nigeria.²² Those who had heard about cervical cancer screening in this study were 76.1%, which is higher than 37.8% from a study in Gondar,¹⁹ 42.7% in Addis Ababa,²⁷ and 34.5% in Nigeria.²² The source of information in the majority of the cases was health personnel which was similar to another study conducted in Addis Ababa.²⁰ This could be explained by the fact that the study population has a higher rate of health care facility visits for regular follow-up and filling of medication.

Respondents who had not heard about cervical cancer were 75% (AOR = 0.25 (95% CI = 0.08, 0.81)) less likely to be screened than those who had heard about cervical cancer and who had not heard about cervical cancer screening were 78% less likely to be screened than those who had heard about cervical cancer screening. Similarly, studies conducted in Kenya and Nigeria showed that good level of awareness about cervical cancer and screening were significantly associated with uptake of screening with (OR = 2.30, 95% CI = 1.06, 4.97, $p = 0.03$) and (OR = 1.5, 95% CI = 1.2, 2.0), respectively.^{21,22} Therefore, the finding of this study implied that the lack of awareness about cervical cancer and screening is a significant factor for the very low level of the screening uptake. Counseling women on cervical cancer screening when they are first diagnosed with HIV has the potential to increase women's awareness of cervical cancer screening, and hence increasing their uptake by incorporating screening service with HIV care.

Limitations of the study

This study was an institution-based study and conducted in an urban setting. Hence, the findings of the study might

Table 2. Awareness about cervical cancer and screening among HIV-positive women attending ART clinic in St. Paul's and Zewditu Hospitals, Addis Ababa, Ethiopia, 2015 (*n* = 411).

Variables	Category	Frequency	%
Ever heard about cervical Cancer (<i>n</i> = 411)	Yes	336	81.8
	No	75	18.2
Ever heard about cervical cancer screening (<i>n</i> = 411)	Yes	312	76.1
	No	99	23.9
Source of information about screening (<i>n</i> = 312)	Electronic media	49	15.7
	Health personnel	258	82.7
	Other sources	5	1.6
Sign and symptoms of cervical cancer	Vaginal bleeding	106	31.5
	Pain during sexual intercourse	97	28.9
	Watery vaginal discharge	28	8.3
	Do not know	151	44.9
Could cervical cancer be treated? (<i>n</i> = 336)	Yes	296	88.1
	No	8	2.4
	Do not know	32	9.5
At which stage it has the best treatment outcome? (<i>n</i> = 296)	Early stage	275	92.9
	Do not know	21	7.1
Reported predisposing factors for cervical cancer	Multiple sexual partners	305	90.8
	Low immunity due to HIV/AIDS	286	85.1
	Smoking	171	50.8
	Starting sex early	216	64.3
	Sexually transmitted infections	175	52.1
Could a healthy-looking person have cervical cancer? (<i>n</i> = 336)	Yes	324	96.4
	No	4	1.2
	Do not know	8	2.4
Could cervical cancer be prevented? (<i>n</i> = 336)	Yes	303	90.2
	No	4	1.2
	Do not know	29	8.6
Reported prevention methods of cervical cancer	Seeking screening service	213	70.3
	Early treatment for STIs	150	49.5
	Sticking to one sexual partner	283	93.4
	Avoiding smoking	141	46.5
Reported place for cervical cancer screening (<i>n</i> = 312)	Health facilities	260	83.5
	Do not know	52	16.5

ART: anti-retroviral therapy; STD: sexually transmitted disease.

Table 3. Predictors of cervical cancer screening uptake among HIV positive women attending ART clinic in St. Paul's and Zewditu Hospitals, Addis Ababa, Ethiopia, 2015 (*n* = 411).

Variables	Category	Screening status		COR 95% CI	AOR 95% CI
		Yes	No		
Age (years)	<35	38	105	1.00	1.00
	35–39	33	102	1.11 (0.65, 1.92)	1.69 (0.90, 3.17)
	>39	34	99	1.01 (0.62, 1.81)	1.15 (0.59, 2.25)
Marital status	Single	19	80	1.00	1.00
	Married	63	133	0.50 (0.28, 0.89)	0.57 (0.28, 1.15)
	Divorced	12	50	0.99 (0.44, 2.21)	1.09 (0.47, 2.95)
	Widowed	11	43	0.93 (0.40, 2.13)	0.80 (0.29, 2.18)
Level of education	Illiterate	18	69	1.00	1.00
	Primary	23	77	0.87 (0.43, 1.75)	1.18 (0.53, 2.65)
	Secondary	41	117	0.74 (0.40, 1.40)	1.07 (0.50, 2.23)
	Diploma	19	40	0.55 (0.26, 1.17)	0.90 (0.34, 2.38)
	Degree and above	4	3	0.20 (0.04, 0.95)	0.33 (0.05, 1.96)

(Continued)

Table 3. (Continued)

Variables	Category	Screening status		COR 95% CI	AOR 95% CI
		Yes	No		
Employment status	Government	40	87	1.00	1.00
	Private	47	137	1.34 (0.81, 2.21)	0.99 (0.50, 1.95)
	Not employed	18	82	2.09 (1.11, 3.94)	1.17 (0.47, 2.93)
Income (ETB)	≥600	59	139	1.00	1.00
	<600	46	167	1.54 (0.92, 2.22)	1.18 (0.64, 2.18)
Religion	Orthodox	77	194	1.00	1.00
	Muslim	16	57	1.41 (0.77, 2.61)	1.93 (0.90, 4.12)
	Protestant	12	45	1.49 (0.75, 2.97)	2.35 (0.99, 5.56)
	Catholic	0	10	–	–
Duration after first diagnosis of HIV infection (in months)	<6	1	16	6.16 (0.80, 47.45)	2.25 (0.24, 21.44)
	6–11	3	35	4.49 (1.33, 15.14)	0.79 (0.17, 3.58)
	12–23	7	20	1.10 (0.44, 2.73)	0.54 (0.17, 1.69)
	24–35	9	28	1.19 (0.54, 2.68)	1.23 (0.50, 3.00)
	36–59	23	46	0.77 (0.43, 1.38)	0.95 (0.50, 1.80)
	>60	62	161	1.00	1.00
Ever heard about cervical cancer	Yes	101	235	1.00	1.00
	No	4	71	0.13 (0.05, 0.36)	0.25 (0.08, 0.81)*
Ever heard about cervical cancer screening	Yes	99	213	1.00	1.00
	No	6	93	0.14 (0.06, 0.33)	0.22 (0.06, 0.60)*

ART: antiretroviral therapy; COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval.

*Statistically significant findings.

not represent the rural women in Ethiopia. Moreover, since we relied entirely on respondents' responses recall bias might have been introduced. A qualitative study, which this study did not employ, to look at detailed opinions and attitudes toward cervical cancer screening uptake would have provided more detailed insight.

Conclusion

The uptake of cervical cancer screening among HIV-positive women in St. Paul's and Zewditu Hospitals, Addis Ababa, Ethiopia, was very low. Knowledge of cervical cancer and screening was a significant predictor of cervical screening uptake. To increase the uptake of the screening program, large-scale intervention and awareness programs about cervical cancer and screening should be designed and implemented particularly for women living with HIV/AIDS.

Acknowledgements

The authors are thankful for the data collectors, hospital administrations, staff, and study participants who participated in the study.

Author contributions

K.E. conceived the study. T.-A.A. and K.E. designed the study and performed data analysis. T.-A.A. and A.A. compiled the whole work and prepared the manuscript. T.-A.A. and A.A.

participated in design, analysis, reviewing the main document, and in the critical revision of the manuscript. All authors read and approved the final manuscript.

Availability of data

Data will be available upon request of the authors.

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.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Admas Abera  <https://orcid.org/0000-0001-7577-7576>

References

1. Zur Hausen H. Papillomaviruses in the causation of human cancers—a brief historical account. *Virology* 2009; 384: 260–265.
2. Bruni L, Barrionuevo-Rosas L, Albero G, et al. ICO information center on HPV and cancer (HPV Information Centre). *Human Papillomavirus and related diseases in the world*. Summary Report, <https://hpvcentre.net/statistics/reports/XWX.pdf>

3. Ferlay J, Soerjomataram I, Ervik M, et al. *Cancer incidence and mortality worldwide*. Lyon: International Agency for Research on Cancer, World Health Organization, 2013.
4. Centers for Disease Control Prevention. *HPV Fact Sheet*. Geneva: World Health Organization, 2011.
5. Six C, Heard I, Bergeron C, et al. Comparative prevalence, incidence and short-term prognosis of cervical squamous intraepithelial lesions amongst HIV-positive and HIV-negative women. *AIDS* 1998; 12: 1047–1056.
6. Maiman M. Management of cervical neoplasia in human immunodeficiency virus-infected women. *J Natl Cancer Inst Monogr* 1998(23): 43–49.
7. Stewart BW and Wild CP. World cancer report 2014. *World Health Organization*, 2014, <https://publications.iarc.fr/Non-Series-Publications/World-Cancer-Reports/World-Cancer-Report-2014>
8. Tanon A, Jaquet A, Ekouevi DK, et al. The spectrum of cancers in West Africa: associations with human immunodeficiency virus. *PLoS ONE* 2012; 7: e48108.
9. Bezerra LMD. Global report on human settlements 2009: planning sustainable cities, edited by United Nations Human Settlement Programme, UK and United States, Earthscan, 2009, 336 pp., US\$58.00 (paperback), ISBN 9781844078998. *Urban Res Pract* 3: 229–230.
10. Bruni L, Barrionuevo-Rosas L, Albero G, et al. Human papillomavirus and related diseases in the World. *Summary Report 2014*. Barcelona: *ICO Information Centre on HPV and Cancer (HPV Information Centre)*, 2014.
11. Gedefaw A, Astatkie A and Tessema GA. The prevalence of precancerous cervical cancer lesion among HIV-infected women in Southern Ethiopia: a cross-sectional study. *PLoS ONE* 2013; 8: e84519.
12. World Health Organization. WHO guidelines for screening and treatment of precancerous lesions for cervical cancer prevention. World Health Organization, 2013. Available from: https://apps.who.int/iris/bitstream/handle/10665/94830/9789241548694_per.pdf
13. Kawonga M and Fonn S. Achieving effective cervical screening coverage in South Africa through human resources and health systems development. *Reprod Health Matters* 2008; 16: 32–40.
14. Parham GP, Sahasrabudde VV, Mwanahamuntu MH, et al. Prevalence and predictors of squamous intraepithelial lesions of the cervix in HIV-infected women in Lusaka, Zambia. *Gynecol Oncol* 2006; 103: 1017–1022.
15. Agaba PA, Thacher TD, Ekwempu CC, et al. Cervical dysplasia in Nigerian women infected with HIV. *Int J Gynecol Obstetric* 2009; 107: 99–102.
16. The Federal Democratic Republic of Ethiopia Ministry of Health. Guideline for Cervical Cancer Prevention and Control in Ethiopia, January 2015, <https://www.iccp-portal.org/system/files/plans/Guideline%20Eth%20Final.pdf>
17. Gelibo T, Roets L, Getachew T, et al. Coverage and factors associated with cervical cancer screening: results from a population-based WHO steps study in Ethiopia. *Adv Oncol Res Treat* 2017; 1(115): 2.
18. Erku DA, Netere AK, Mersha AG, et al. Comprehensive knowledge and uptake of cervical cancer screening is low among women living with HIV/AIDS in Northwest Ethiopia. *Gynecol Oncol Res Pract* 2017; 4(1): 20.
19. Nega AD, Woldetsadik MA and Gelagay AA. Low uptake of cervical cancer screening among HIV positive women in Gondar University Referral Hospital, Northwest Ethiopia: cross-sectional study design. *BMC Women's Health* 2018; 18(1): 87.
20. Belete N, Tsige Y and Mellie H. Willingness and acceptability of cervical cancer screening among women living with HIV/AIDS in Addis Ababa, Ethiopia: a cross-sectional study. *Gynecol Oncol Res Pract* 2015; 2(1): 6.
21. Lukorito J, Wanyoro A and Kimani H. Uptake of cervical cancer screening among HIV positive women in comprehensive care centers in Nairobi, Kenya. *Res Obstetr Gynecol* 2017; 5(1): 1–6.
22. Ezechi OC, Gab-Okafor CV, Ostergren PO, et al. Willingness and acceptability of cervical cancer screening among HIV positive Nigerian women. *BMC Public Health* 2013; 13: 46.
23. Leece P, Kendall C, Touchie C, et al. Cervical cancer screening among HIV-positive women Recherche Les Femmes VIH Positives. *Can Fam Physician* 2010; 56: 425–431.
24. Donatus L, Nina FK, Sama DJ, et al. Assessing the uptake of cervical cancer screening among women aged 25–65 years in Kumbo West Health District, Cameroon. *Pan African Med J* 2019; 33: 106.
25. AbiodunOlumide A, Fatungase KO, Olu-AbiodunOluwatosin O, et al. An assessment of women's awareness and knowledge about cervical cancer and screening and the barriers to cervical screening in Ogun State, Nigeria. *IOSR J Dental Med Sci* 2013; 10(3): 52–58.
26. Black E, Hyslop F and Richmond R. Barriers and facilitators to uptake of cervical cancer screening among women in Uganda: a systematic review. *BMC Women's Health* 2019; 19(1): 108.
27. Getachew S, Getachew E, Gizaw M, et al. Cervical cancer screening knowledge and barriers among women in Addis Ababa, Ethiopia. *PLoS ONE* 2019; 14(5): 1–13.