

Prevalence of Cervical Cancer and Associated Risk Factors among Women Attending Cervical Cancer Screening and Diagnosis Center at Yirgalem General Hospital, Southern Ethiopia

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Abstract

Introduction: A worldwide estimated annual case of cervical cancer is 493,000 and ends with 273,500 annual deaths. In developing countries, it accounts for about 85% of both its morbidity and mortality. According to the report from World health organization, globally in 2012, cervical cancer incidence was 7.9%, mortality 7.5% and five-year prevalence was 9%. In sub-Saharan Africa the incidence was 25.2%, mortality 23.2% and five-year prevalence was 27.6%. In Ethiopia the incidence was 17.3%, mortality 16.5% and five-year prevalence was 18.2%.

Methods: Retrospective cross-sectional study was conducted between 10/08/08 up to 28/01/2009 E.C. Data was collected from August 17th, 2002 E.C to 2008 E.C all charts of cervical cancer patients diagnosed and screened between August 17th, 2002 E.C to 2008 E.C at Yirgalem General Hospital was retrieved from cervical cancer screening and diagnosis logbook. Univariate, bivariate and multivariate analysis were performed using SPSS version 20.

Results: from the screened clients, 16.5% had cervical cancer. From the screened and diagnosed clients those with multiple sexual partners had 40 times higher odd of cervical than those with no multiple sexual partners. This study revealed that being Human immune deficiency virus positive (AOR=9.033: 95% CI 4.537, 17.985), sexually transmitted infection history (AOR=8.364:95% CI: 5.639, 12.405) and early age at initiation of sexual intercourse (AOR=8.968:95% CI 5.588, 14.393) have statistically significantly associated with cervical cancer in multivariate analysis

Conclusion: Of screened clients, 16.5% were with acetone white lesion and the risk factors for cervical cancer were having multiple sexual partners, human immune deficiency virus positive, history of sexually transmitted infection and early age at initiation of sexual intercourse. Early screening on mass campaign and focus from the government and other stake holders by strengthening both cancer prevention and control program and implementation strategies through due attention on the associated risk factors of the study.

Keywords: Cervical cancer; risk factors; Prevalence multivariate analysis

Abbreviations: CC: Cervical Cancer; CCS: Cervical Cancer Screening; CIN: Cervical Intraepithelial Neoplasia; HSIL: High Grade Squamous Intraepithelial Lesion; HPV: Human Papilloma Virus; HR HPV: High Risk Human Papilloma Virus; SIL: Squamous cell Intraepithelial Lesion; SNNPR: Southern Nations Nationalities and People's Region; VIA: Visual Inspection of Acetic Acid; MSP: Multiple Sexual Intercourse; YGH: Yirgalem General Hospital

Introduction

Cervical cancer is a cancer arising from the cervix, in which the cells of the cervix become abnormal and start to grow uncontrollably, forming tumor. Approximately 90% of intraepithelial neoplasia is attributed to human papillomavirus (HPV) infection. Only certain types of HPV cause high grade intraepithelial lesions and cancer. The most common HPV are HPV-16, -18, -31, -33, -35, -39, -45, -51, -52, -56, and -58. Type 16 is the most common form of HPV found in invasive cancer and in CIN 2 and CIN 3 and HPV-18 is more specific than HPV-16 for invasive tumors- found lower (2%) in negative finding. In most women, the infection will clear in 9 to 15 months. Any factor that influences the integration of HPV DNA into the human genome may

cause progression to invasive disease. The two major histologic types of cervical cancer are adenocarcinoma and squamous cell carcinoma. From this 99% of women with squamous cervical carcinoma caused by Human Papilloma virus (HPV) infection [1].

The risk for developing cervical cancer is associated with early age of first intercourse, multiple sexual partners, smoking and infection with HPV, use oral contraceptive for a longer period and occupation are the risk factors for the developing cervical cancer [1]. In addition, a woman who has sexual intercourse with a male partner who in turn has had

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intercourse with multiple women also confers as a significant risk to develop cervical cancer [2,3]. Majority of the cases are associated with an increased risk of acquiring or having inappropriate compromised immune response to infection with HPV, the etiologic agent of most cervical cancer [1].

A non-communicable disease like cervical cancer creates devastating effects in the developing countries. According to the World Health Organization (WHO) and international union against cancer, 24.6 million people are living with cancer around the world. In 2002 and 2008, cancer accounted for the deaths of 7.6 million people [1,4]. Globally cancer is the fifth and the second most frequent malignancy in men and women respectively. Overall, 715,000 new cancer cases and 542,000 cancer deaths were estimated occurrence in Africa [4,5].

Approximately half a million women develop cervical cancer each year with an estimated 85% in developing countries [4,5]. It is the most common among women of sub-Saharan Africa following breast cancer in northern Africa [6]. In South Africa, cervical cancer is the most common cancer in black women and fourth among white women. Among women in developing countries those who have appeared with advanced disease, it remains a major cause of morbidity and mortality [7].

A considerable reduction in cervical cancer (CC) incidence and deaths has been achieved in developed countries with systematic cytological screening programs. Thus, it is largely preventable by effective screening programs. However, this has not been possible in most limited resource countries mainly because of systematic screening is rarely performed [8]. In Ethiopia, Cervical Cancer ranks as the 2nd most frequent cancer among women between 15 and 44 years of age. Every year, 4648 women are diagnosed with cervical cancer and of this, 3,235 ends with death [9].

Generally, worldwide trends show that developing countries going through rapid societal and economic changes. The shift towards the lifestyles of industrialized countries leads to a rising burden of cancers associated with reproductive, dietary, and hormonal risk factors [10-33]. In 2013, WHO launched the Global Action Plan for the Prevention and Control of Non-Communicable Diseases from 2013-2030. The aim is to reduce premature mortality from Cancer, Cardiovascular diseases, Diabetes and Chronic respiratory diseases by 25%.

In Ethiopia, despite there was no separate cervical cancer prevention strategy and screening program, Ethiopian reproductive health strategy gives due attention to reproductive organ as one of its components. There is also project named “Adistesefa” by pathfinder international in Ethiopia that supports comprehensive facility services, educate the community about cervical cancer prevention, and establish lasting alliances with local partners. Together with the Federal Ministry of Health (FMOH) and Stanford University Program for International Reproductive Education and Services (SPIRES), the project aims to establish services in 14 health institutions (including five Cervical Cancer Prevention Centers of Excellence) in the regions of Addis Ababa, Amhara, Oromia, Tigray, and Southern Nations Nationalities and People's Region (SNNPR) [10].

Recently, FMOH launched guide line for cervical cancer prevention which aims to provide healthcare providers, implementing partners and other stake holders involved in the prevention and control of cervical cancer in Ethiopia with standardized cervical cancer prevention and control health service delivery directive. And From the pilot project with path finder, FMOH planned to scale up screening service to public health care facilities.

Cervical cancer is the commonest cancer cause of death among women in developing countries. “Mortality due to cervical cancer is also an indicator of health inequities, as 85% of all deaths due to cervical cancer are in developing, low- and middle-income countries [1]. According to the report from WHO, globally in 2015, cervical cancer incidence was 7.9%, mortality was 7.5% and five-year prevalence was 9%. In sub-Saharan Africa the incidence was 25.2% and mortality was 23.2% and the five-year prevalence was 27.6%. In Ethiopia the incidence was 17.3% was mortality 16.5% and five-year prevalence was 18.2% [4].

Cervical cancer is the commonest cancer affecting reproductive organ and leading cause of death among women]. It is one of the registered Cancers with increasing incidence trends in the US: 1999-2008 [1]. Internationally, the burden of cervical cancer falls most heavily on developing nations. About 85% of the cases and 88% of the deaths due to cervical cancer occur in developing nations. Women in developing nations are at a 35% greater lifetime risk of developing cervical cancer than women in high-income countries. Although cervical cancer is most common in women older than 50 years, in developing nations, it is becoming increasing prevalent among women during their reproductive age 15-49 years [6].

It was estimated that 20.9 million women were at risk of developing cervical cancer in Ethiopia with an estimated 4648 annual number of new cases and 3235 annual number of deaths respectively [5]. Cervical cancer is the second most common cancer and the fourth leading cause of Cancer related deaths among women worldwide. Currently Ethiopia has a population of 20.9 million women aged 15 and older who are at risk of developing cervical cancer. Each year an estimated 7619 women are diagnosed with cervical cancer; 6081 die from the disease. Crude incidence rates of cervical cancer in Ethiopian women per 100 000 population per year are estimated to be 23 [1]. Early screening on mass campaign and focus from the government and other stake holders by strengthening both cancer prevention and control program and implementation strategies through due attention on the predictors of cervical cancer is vital. Therefore, the aim of this study is to investigate the prevalence and associated risk factors of cervical cancer among clients that have been screened for cervical cancer in Yirgalem general hospital.

Despite the growing number of cervical cancer cases in Ethiopia, still there is a gap in knowledge of risk factors. By considering the increasing pattern of the disease and high prevalence of risk factors, the need for cervical cancer prevention program is crucial. Data from the primary health care facilities are also scarce to see the problem for better intervention. To establish and improve any program and strategy, understanding the prevalence and associated risk factors of cervical cancer is become important. In Ethiopia Information related to cervical cancer like knowledge of the disease, attitude and practice towards screening is very limited. Identification of the factors associated with cervical cancer will help the Ministry of Health and Social Welfare in development of a cervical cancer health promotion and preventive strategy to mitigate the prevalence and the lethality of the case. Furthermore, it helps health specialists, policy makers, and planners on cervical cancer prevention; which is a practical method for a setup with no universal national HPV vaccine coverage like Ethiopia. In addition, the finding of this study will point in making evidence based public health actions and refine the preventive activities within the national cervical cancer preventive and control strategies.

Methods

Study setting and study design

Yirgalem General Hospital is found in Sidaman zone, located in southern nations, nationalities and people's regional state (SNNPR). Sidama zone is one of the zones found in SNNPR; the zone has 19 woredas and four city administrations. Yirgalem town is one of the four city administrations and which is located at 317 km from Addis Ababa the capital city of Ethiopia and 47 km from Hawassa, the capital of SNNPR and Yirgalem general Hospital is found in Yirgalem town. It is the largest public hospital which was built in the early 1954 E.C with approximately 230 inpatients beds. The Yirgalem General Hospital Cervical Cancer Treatment Center was established seven years ago. Currently two nurses working at the Cervical Cancer Center. Retrospective cross-sectional study was conducted between 10/08/08 up to 28/01/2009 E.C. Data was collected from August 17th, 2002 E.C to 2008 E.C all charts of cervical cancer patients diagnosed and screened between August 17th, 2002 E.C to 2008 E.C at Yirgalem General Hospital was retrieved from cervical cancer screening and diagnosis logbook that met the inclusion criteria.

Sample size determination and sampling procedure

All women who have attended cervical cancer screening and diagnosis center at Yirgalem General Hospital. Non-probable purposive samplings were used. Data was collected from secondary data using checklist. And, the data collectors were those who work at the cervical cancer screening and treatment center.

Data quality

The checklists filled were gathered and checked for completeness. Extracted data was entered in to statistical package of social science software version 20 and univariate, bivariate and multivariate analysis were performed.

Ethical issues

The ethical issue was assured by Hawassa College of health science internal review board for ethical approval. Consent was obtained from administrative body and hospital staffs. And all data collected were kept confidentially and study was conducted over the dictated time.

Results

A total of 2120 patient with acetowhite lesion and no acetowhite lesion were registered on Yirgalem general hospital cervical cancer registration log book. During data collection, 1945 were included in the study and the rest 175 cases were completely excluded due to missing of one or more study variables. Out of the total extracted data, 1805 (92.8%) were in the age ≥ 35 years and mean age of the patients was 41.66 ± 7.68 . 1210 (62.2%) of the clients were living in urban and the remaining 733 (37.8%) were living in rural. Regarding marital status 1459 (75%) were married and the rest 200 (10.3%), 175 (9%), 89 (4.6%) were, divorced, widowed, and single respectively. The majority of the cases, 1534 (78.9%) of the client's educational status was literate and the remaining 411 (21.1%) were no able to read and write. 1106 (59.6%) of clients were employed. and the remaining 839 (43.1%) were unemployed (Table 1). Out of the study population, 321 (16.5%) were detected as acetowhite lesion positive and the remaining were negative for acetowhite lesion. Concerning the status of the study subjects' risk factors, some of reproductive and behavioral risk factors for cervical cancer were multipara 1360 (69.9%), grand multipara, 484 (24.9%) and nulipara 101 (5.2%) respectively. According to the study, 1487 (76.5%)

were contraceptive users and the remaining 458 (23.5%) were non-users. History of STI 468 (24.1%) have STI history and the remaining have no STI history, HIV/AIDS 64 (3.3%) were positive for HIV status and the remaining 1880 (96.7%) were negative for HIV status, regarding to age at first intercourse about 1220 (62.7%) were age <18 , and the rests 725 (37.3%) were age ≥ 18 . Cigarette smoking about 95 (4.9%) were smoking cigarette and the rests are non-smokers, and concerning to multiple sexual partners 210 (10.8%) were have had multiple sexual partners and the remaining are not have had multiple sexual partners (Table 2).

Socio-demographic variable	Frequency	Percent (%)
Age of the women		
<35	140	7.2
≥ 35	1805	92.8
Address		
Urban	1210	62.2
Rural	735	37.8
Marital status		
Single	89	4.6
Married	1459	75.0
Divorced	200	10.3
Widowed	175	9.0
Others	22	1.1
Occupation		
Employed	1106	56.9
Unemployed	839	43.1
Educational status		
Illiterate	411	21.1
Literate	1534	78.9
n=1945		

Table 1: Socio-demographic characteristics of women attending oncology center at Yirgalem General Hospital in the period between 2002 E.C-2008 E.C.

Associated factors for CC	Frequency	Percentile (%)
Parity		
0	101	5.2
1-5	1245	64.0
≥ 5	593	30.5
Use of contraceptive		
Yes	1487	76.5
No	458	23.5
History of STI		
Yes	468	24.1
No	1477	75.9
HIV status		
Negative	1880	96.7
Positive	65	3.3
Age at first intercourse		
<18	1220	62.7
≥ 18	725	37.3
Cigarette smoking		
Yes	95	4.9
No	1850	95.1
Multiple sexual partner		
Yes	210	10.8
No	1735	89.2
VIA		
Yes	321	16.5
No	1624	83.5

Table 2: Reproductive and behavioral characteristics of study population Yirgalem, Ethiopia, and 17th August 2002 E.C-2008 E.C

Out of the total clients, 321 (16.5%) were acetowhite lesion positive and the remaining 1624 (83.5%) were negative for acetowhite lesion (Figure 1). The majority 125 were diagnosed in 2003 and the rest 3, 67, 90, 7, 17, 12 were diagnosed in 2002, 2004, 2005, 2006, 2007 respectively. 140 (43.75%) women with acetowhite lesion were manifested with post coital bleeding (Figure 2). The likelihood of having cervical cancer among urban residents was 2.766 times higher as compared to those living in rural (COR=2.766: 95% CI: 2.071,3.695). The likelihood of getting cervical cancer among women who reported as marital status single was significantly associated as compared to married women (COR=5.4: 95% CI: 3.489,8.387) and the likelihood of cervical cancer among literate women was 6.1 times higher as compared to with those

illiterate women (COR=6.1: 95% CI: 6.1 3.660,10.257). According to the study, employed women were 3.586 times more likely to have cervical cancer as compared to unemployed women (COR=3.586: 95% CI: 2.686, 4.789) (Table 3).

This study shows that, multipara women were 3.484 times more likely to have cervical cancer as compared to nullipara women (COR=3.484: 95% CI: 2.289, 5.304). The odds of cervical cancer among ever users of oral contraceptive were significantly increased by 97% as compared to never users of oral contraceptives (COR=1.975: 95% CI:1.421, 2.745). Age at first sexual intercourse women's age less than 18 was 3.756 times risk to develop cervical cancer than those age > 18

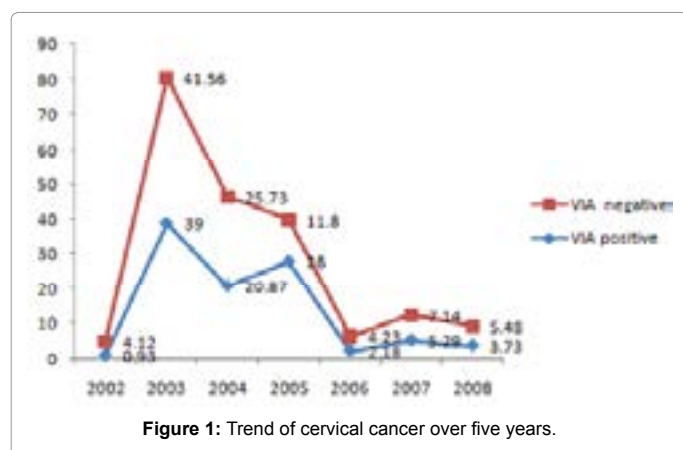


Figure 1: Trend of cervical cancer over five years.

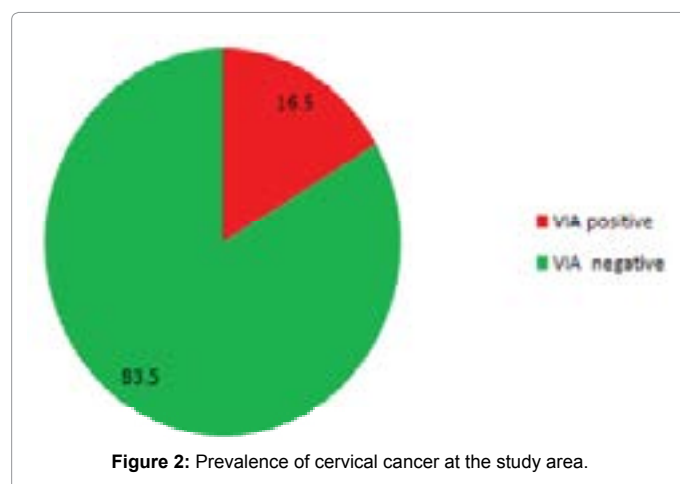


Figure 2: Prevalence of cervical cancer at the study area.

Variables		VIA positive	VIA negative	COR for 95% CI	AOR for 95 % CI
Age	<35	43	97	1	-
	≥ 35	278	1527	0.4 (0.2810-601)	**
Address	Urban	256	65	2.7 (2.071-3.695)	**
	Rural	954	670	1	-
Marital status	Single	45	44	5.4 (3.4898.387)	**
	Married	232	1227	1	-
	Divorced	39	161	1.2 (8791.868)	**
	Other	5	192	0.2 (0.034.881)	**
Occupation	Employed	256	850	3.5 (2.686-4.78)	**
	Unemployed	65	774	1	-
Educational status	Illiterate	16	395	1	-
	Literate	305	1229	6.1 (3.6-10.257)	**
Parity	Nullipara	39	62	1	-
	Multipara	282	1562	3.4 (2.28-5.304)	**
Contraceptive user	Yes	274	1213	1.9 (1.421-2.7)	**
	No	47	411	1	-
STI history	Yes	213	255	10.5 (8.10-13.8)	8.3 (5.6-12)*
	No	108	1369	1	1
HIV status	positive	39	26	8.5 (5.0-14.1)	9.0 (4.5-18)*
	Negative	282	1598	1	1
Age at first intercourse	<18	270	950	3.7 (2.741-5.1)	8.9 (5.5-14)*
	≥ 18	51	674	1	1
MSP	Yes	162	48	33.4 (23-47.9)	40 (22.8-70)*
	No	159	1576	-	-
Cigarette smoking	Yes	30	65	2.4 (1.5-3.87)	**
	No	291	1559	1	-

NB * P<0.05 and ** not significant

Table 3: Bivariate and multivariate analysis of risk factors associated with cervical cancer at Yirgalem General Hospital.

with (COR=3.756 :95% CI: 2.741,5.147). Multiple sexual partners were 33.453 times having risk to develop cervical cancer than those who had no multiple sexual partners (COR=33.453: 95% CI: 23.315, 47.998). According to cigarette smoking status, those smokers were 2.473 times having risk to develop cervical cancer than those who have no cigarette smoking exposure (COR=2.473: 95% CI: 1.576, 3.879). Women who had suffered with any sexually transmitted disease were 10.588 times more likely to develop cervical cancer as compared to those women who had never suffered any sexually transmitted disease (COR=10.588: 95% CI :8.104,13.83). The study reveals that, being positive with HIV were 8.5 times risk to develop cervical cancer than those women who have no HIV positive (COR=8.5: 95% CI: 5.093,14.185). Women those who reported to have more than one sexual partners in the past had 33 times increased odds of having cervical cancer as compared to women those who had a single casual partner (COR=33:95% CI: 23.315,47.998). The odds of developing cervical cancer was 2.47 times more among ever smokers as compared to never smokers (COR=2.47: 95% CI:1.576,3.879). Variables became significant on bivariate analyses or p-value <0.25 were re-entered in to Multivariate analysis to control for possible potential confounders. Risk factor investigated for their causal were maternal education, address of the mother, occupation status, marital status, parity, gravidity, number of sexual partners, contraceptive use, HIV status, STI history, age at first inter course and cigarette smoking. Of the total variables, only, being HIV positive, having STI history, age at first inter course, and having multiple sexual partner were found to be independently and significantly associated with the likelihood of having cervical cancer while the rest variables were no significant association during multivariate analysis after controlling for potential confounders in fact they became significant during multivariate analysis.

Discussion

This study reveals that, 7 years cervical cancer prevalence is 16.5%. Urban resident, literacy, occupational status employed, number of delivery increased, HIV status positive, having multiple sexual partners, history of STI exposure, using contraceptives, exposure of cigarette smoking and initiation of early sexual intercourse are variables associated in bivariate analysis. After controlling for possible potential confounders, HIV positive, multiple sexual partners, having STI, and early sexual intercourse independently and significantly associated with cervical cancer. Having multiple sexual partners increases the chance of acquiring. Studies that have been conducted in both rural and urban areas show that significant association between having multiple sexual partners and cervical cancer [11]. A study in Morocco shows that promiscuity and polygamist which is related to multiple sexual partners increases the risk of cervical cancer [11]. The finding of this study reveals that multiple sexual partners are significantly associated with cervical cancer as compared to those women who have no exposure of multiple sexual partners (AOR=40; 95% CI: 22.44,70.204) and having history of STI exposure and being HIV positive became significant with the outcome variable of the study as compared to those women who have no history of STI exposure and HIV negative (AOR=8.3 :95%CI: 5.639,12.405) and (AOR=9:95% CI: 9:4.537,17.985) respectively. This is similar with the study that has been conducted on cervical cancer screening program in Beijing [32]. A study in Zambia among HIV infected women states that HIV positive women have higher likelihood of having high grade cervical squamous intra epithelial lesion (AOR=8.0 :95% CI: 20.54,52.04) and cervical cancer cases are reported to occur in more in the immune suppressed cases [4]. Early sexual debut is reported more documented among cervical cancer patients than the

late counterparts. This is mainly because at young age the cervix has immature membrane thus making it susceptible to oncogenic agent particularly (HR HPV) Cooper) [24,25]. In this study, women who began first intercourse at early age became significant with cervical cancer as compared to those who did not begin first intercourse at early age (AOR=8.9:95%CI: 5.588,14.393). The same type of finding was consistently reported that initiation of sexual practice too early became a risk factor in most previous epidemiological studies of cervical cancer (AOR=8.9: 95% CI 8.38, 11.983) [34-40].

Conclusion

From the screened and diagnosed clients in consecutive 7 years, the prevalence of the cervical cancer is 16.5%. The risk factors that became significant with CC are maternal occupation, education status, mothers address, having multiple sexual partners, being HIV positive, exposure of STI and early age at initiation of sexual intercourse are identified predictors of the cervical cancer as compared to non-cancerous patients by using bivariate analysis. By using multivariate analysis after controlling the possible potential confounders, being HIV positive, having multiple sexual partners, having STI history, and initiation of early sexual intercourse became independently and significantly associated with cervical cancer.

1. Strengthening both cancer prevention control programs and implementation strategies by addressing socio-demographic, behavioral and reproductive factors of the study became very crucial.
2. Giving sexuality education tailored to age and culture, early screening and treatment for cervical cancer and provision of condoms for those who have practice of having multiple sexual partners, STI including HIV.
3. Advocate delaying of age at initiation of sexual intercourse too early to mitigate the preventive and controllable cause of cervical cancer.
4. Prepare consistent mass campaign for cervical cancer screening and diagnosis as it is vital to track the cases early.
5. For researchers: Comprehensive and qualitative study became recommended as this study was limited to assess the prevalence and associated risk factors of cervical cancer at Yirgalem general hospital.
6. Responsibility should be taken by government, nongovernmental organizations, and other collaborative stakeholders so as prevent the predictors of this study; these are having multiple sexual partners, being HIV positive, exposure of STI and early age at initiation of sexual intercourse.

Competing Interests

The authors declare that they have no competing interests in this section.

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