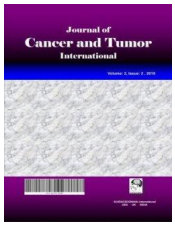

*Journal of Cancer and Tumor International*

*9(2): 1-15, 2019; Article no.JCTI.45462*
*ISSN: 2454-7360*

# Proportions of Pre-Cancerous Cervical Lesions and Its Associated Factors among Women Clients in the Age Group of 30-49yrs in Gynecology Ward of Dessie Referral Hospital and FGAE, North-East Ethiopia, 2016

**Kibir Temesgen[1*], Amare Workie[1], Tenagnework Dilnessa[1] and Mengistu Abate[1]**

*[1]Department of Midwifery, College of Medicine and Health Science, Wollo University, Ethiopia.*

***Authors' contributions***

*This work was carried out in collaboration among all authors. All the authors contributed in the data analysis, design and preparation of the manuscript. All authors read and approved the final manuscript and have all agreed to its submission for publication.*

***Article Information***

DOI: 10.9734/JCTI/2019/v9i230105
Editor(s):
(1) Dr. William C. S. Cho, Queen Elizabeth Hospital, Hong Kong.
(2) Dr. Bing Yan, Department of Oncology, Hainan Branch of PLA General Hospital, China.
Reviewers:
(1) Godstime I. Irabor, Saba University School of Medicine, Netherlands.
(2) Agnieszka Korolczuk, Poland.
(3) Ruan Carlos Gomes da Silva, Centro Universitário Tabosa de Almeida, Brazil.
Complete Peer review History: http://www.sdiarticle3.com/review-history/45462

***Original Research Article***

***Received 01 November 2018***
***Accepted 06 January 2019***
***Published 13 July 2019***

## ABSTRACT

**Introduction:** Globally, cervical cancer is the second most common cancer in women; in 2008 there were an estimated 530,000 new cases and more than 270,000 women die from it [1]. In Ethiopia, cervical cancer is the second most common cancer following breast cancer and the leading cause of death from cancer. Annually, an estimated number of 4648 women develop the cancer and 3,235 die from it. Low-resource countries experience 85% of the global burden and in regions such as Eastern Africa and South-Central Asia. Low perception of risks and lack of awareness about cervical cancer screening amongst women and challenges of access to cervical cancer screening for early detection of disease have been reported amongst factors responsible for increasing incidence and mortality due to cervical cancer in developing countries [2].

**Corresponding author: Email: kibirwollo@gmail.com, kibirtemesgen78@gmail.com;*

**Objective:** The general objective of this study was to determine the proportions of cervical precancerous lesions and to assess associated factors among women clients (30-49) in Gynecology OPD of Dessie referral hospital and FGAE, 2016.

**Methods:** An institution based cross-sectional study design involving quantitative method was employed. For the quantitative survey 422 women in the age group of 30-49 were participated. The sample size was computed by using single population proportion formula for finite population with 95% confidence level, prevalence of 50% and marginal error of 2%. Pretested and structured questionnaire was used in order to facilitate reliable response. Questionnaires for each item were adapted from previously done similar studies. Pretest was done on five percent of study population.

**Results:** Among 422 study participants who were currently screened, 390(92.4%) were negative for cervical precancerous lesions when tested by visual inspection with acetic acid (VIA), 29(6.9%) were positive for cervical precancerous lesions and 3(0.7%) were suspicious for cancer. The majority (69.9%) of the study subjects did not ever screen for cervical cancer in their life time. Concerning the reasons for not screening, 98(33.3%) of them said that it is painful while 54(18.3%) and 37(12.5%) of them said I am health and it is expensive respectively.

**Conclusion:** The proportion of cervical precancerous lesion was 6.9%. In multivariate regression analysis increased age(≥46), high parity(≥4), first intercourse at <20 years, having ≥ two sexual partners, positive HIV status, History of Human papilloma virus (HPV) infection, History of sexually transmitted infection (STI), Smoking, History of abortion, nonuse of condom and family history of cervical cancer were significantly associated with the development of cervical precancerous lesions.

*Keywords: Cervical pre-cancerous lesions; cervical cancer; human papilloma virus.*

## ABBREVIATIONS

*ACCP : Alliance for cervical cancer prevention*
*ACS : American cancer society*
*AIDS : Acquired Immunodeficiency Syndrome*
*CIN : Cervical Intraepithelial Neoplasia*
*CIS : Carcinoma In Situ*
*EDHS : Ethiopian demographic health survey*
*ESOG : Ethiopian of Obstetrics and Gynecology*
*FDA : Food and drug administration*
*FGAE : Family guidance association of Ethiopia*
*HIV : Human Immunodeficiency Virus*
*HPV : Human Papilloma Virus*
*HR : HPV-high risk Human Papilloma virus*
*LBC : Liquid Based Cytology*
*LEEP : Loop Electrosurgical Excision Procedure*
*LETZ : Loop Excision of the Transformation Zone*
*LGSILs : Low-Grade Squamous Intraepithelial Lesions*
*PPE : Personal Protective Equipment*
*RHB : Regional Health Bureau*
*SCJ : Squamo-columnar Junction*
*SIL : Squamous intraepithelial lesions*
*STA : See and Treat Approach*
*STI : Sexually Transmitted Infection*
*SVA : Single visit approach*
*VIA : Visual Inspection with Acetic Acid*
*WHO : World Health Organization*

## 1. INTRODUCTION

Eighty-three percent of new cases of cervical cancer and 85% of related deaths occur in resource-poor countries; affecting poor, vulnerable, and disenfranchised women at the prime of life. Cervical cancer is the second most common cancer in the world and the third common cause of deaths from cancer in women. Each year, an estimated 530,000 new cases of cervical cancer are diagnosed globally and more than 270,000 women die from it. Of the estimated deaths from cervical cancer, more than 85% occur in developing countries. It is a major cause of morbidity and mortality among women in resource-poor settings, especially in Africa [1]. In Ethiopia, cervical cancer is the second most common cancer following breast cancer and the leading cause of death from cancer. Annually, an estimated number of 4648 women develop the cancer and 3,235 die from it [2]. The majority of cancers (over 80%) in sub-Saharan Africa are detected in late stages, predominantly due to lack of information about cervical cancer and prevention services. Late-stage disease is associated with low survival rates after surgery or radiotherapy. In addition, these treatment modalities may be lacking altogether, or too expensive and inaccessible, for many women in low resource countries. Cervical cancer is potentially preventable, and there are

effective screening and treatment programs that can lead to a significant reduction in the morbidity and mortality associated with this cancer. Reports of trends in cervical cancer mortality from less developed countries have been limited by poor data quality and inaccurate population estimates [3].

More than 534,000 women over age 15 living with HIV in Ethiopia are among the most vulnerable to cervical cancer. Greater than 99.7 % cervical cancer is attributed by human papillomavirus (HPV) infection. A four- to six-fold increased risk for squamous intraepithelial lesions (SIL) or cervical intraepithelial neoplasia (CIN) is estimated in HIV+ women compared with negative women [4]. In developed countries, the proportions of women who are screened by Pap test and VIA vary from 68 to 84%. However, in developing countries, screening coverage is still low, ranging from 2.0% to 20.2% in urban areas and from 0.4% to 14.0% in rural areas [5].

According to the 2009 WHO report, the age-adjusted incidence rate of cervical cancer in Ethiopia was 35.9 per 100,000 patients with 7619 annual number of new cases and 6081 deaths (79.8%) every year [6]. This shows that there is a very high case fatality rate. Despite this fact, very few women receive screening services in Ethiopia. Therefore, this study was aimed to determine the proportion of pre-cancerous cervical lesions and associated factors in the study area.

### 1.1 General Objective

The general objective of this study was to determine the proportions of cervical precancerous lesions and to assess associated factors among women clients (30-49yrs) in Gynecology OPD of Dessie referral hospital and FGAE, 2016.

## 2. MATERIALS AND METHODS

### 2.1 Study Design and Period

An institution based cross-sectional study design involving quantitative method was employed. The total sample size was allocated using probability proportionate to size according to the proportion of average monthly client flow reviewed from registration book and screening was continued until the required sample size is obtained.

### 2.2 Sample Size Estimation

The sample size was computed by using single population proportion formula for finite population with 95% confidence level, 50% prevalence was taken and marginal error of 5%.

### 2.3 Instruments and Measurements

Pretested and structured questionnaire was used and Translation of instrument was made from English language to local Amharic language and back to English language by different experts who were familiar on the field of area and blind on the original version of the questionnaire (English version) in order to facilitate reliable response to underline questions and keep the original meaning of the instruments (to check for consistency). Questionnaires for each item were adapted from previously done similar studies [7]. The instrument contains: Socio-demographic data, Gynecological-obstetrical, clinical and behavioral information.

### 2.4 Data Collection Procedures

Semi structured questionnaire was employed to collect data. Five BSc Nurses who were certified in cervical screening and working in Gynecology ward of Dessie referral hospital and FGAE were recruited as data collectors' and two MSC supervisors were assigned. Un-lubricated bivalve speculum was inserted into the vagina and the cervix was made visualized using a lamp to identify the Squamo-Columnar Junction (SCJ). After cleaning away any excess mucus using a cotton swab, a three- five percent acetic acid solution was applied to the cervix for visual inspection with acetic acid. Findings were evaluated one minute after application. Precancerous lesions were defined as being dense aceto-white lesions with well-defined margins observed within the vicinity of the transformation zone originating from the SCJ, or if the whole cervix or cervical growth turned white. A suspicion of invasive cervical cancer was defined as any cervical ulcer or growth being observed. Results of VIA was classified as negative, positive, or suspicious for Invasive Cervical Cancer (ICC) according to the International Agency for Research on Cancer (IARC) training manual. Screening was also done by pap smear. Sample was sent to laboratory and wait for the result. Whenever there is uncertainty of the screening result the nurses were consulted an experienced gynecologist and he/she confirmed the diagnosis. Positive cases that were eligible were treated with cryotherapy at single visit (see and treat approach). Positive VIA cases who were eligible for cryotherapy includes no suspicious for

cancer, entire extent of the lesion can be seen, aceto-white lesion occupies less than 75% of the cervix, and lesion does not extend beyond the cervix, not pregnant and no cervicitis. The data collection period was for ninety (90) days. Data collectors were trained for one day on questions included in the questionnaire, on screening techniques, purpose of the study, and importance of privacy, discipline and approach to the clients and confidentiality of the respondents. Before conducting the main study, pretest was conducted on five percent of the total sample size (in Dessie health center) which were not included in the main study. Based on the result, data collectors were reoriented and the questionnaire was modified accordingly.

## 2.5 Data Quality Control

From the very beginning, data collectors and supervisor have had a full course of training regarding the basic principles of data collection procedure and pretested questionnaire was used. The principal investigator and supervisors have made a day to day on site supervision during the whole period of data collection. Experienced gynecologist were consulted when uncertainty of the VIA test result occurs which helps to minimize observed bias. At the end of each day, the questionnaires were reviewed and checked for completeness accuracy and consistency by the supervisors and investigators and corrective discussion was undertaken with all the research team members. Following the discussion corrective directions were given on how to eliminate or minimize errors.

## 2.6 Data Processing and Analysis

The questionnaire was checked for completeness and consistency and entered and edited in the computer for statistical analysis. Data was entered in to Epi Info version 3.5.1 database. Furthermore, the data editing and clearance was done on the same software. Finally, the data was taken to SPSS version 23.0 for the final analysis. The findings of the study were summarized and presented using tables, descriptive measures and statistical diagrams. Binary logistic regression was used to assess the effect of independent variables on cervical pre-cancerous lesions and its screening. The measure of association was done using the odds ratio. All covariates with nearly $p \leq 0.2$ in the bi-variable analysis or potential confounders were included in to the final model to obtain adjusted odds ratio and their 95% confidence intervals. All statistical were considered significant at $\alpha = 0.05$ or less.

## 2.7 Ethical Consideration

The study was approved by the Ethical Review Board of Wollo University, college of Medicine and Health Sciences and a cooperation letter was obtained from Dessie referral hospital administrative office. Written consent was obtained from each study participants. The right of the respondents to refuse to answer for any or all questions was respected.

Names of the clients was not recorded in the questionnaires and strict confidentiality was assured through anonymous recording and coding of questionnaire and placed them in safe place after they had been collected; and was used for the purpose of the study only.

# 3. RESULTS

Response was obtained from 422 respondents making the response rate 100%.

## 3.1 Socio-demographic Characteristics

Among the study participants 150(35.60%) of the respondents were found to be in the age group of 46-49 years old and the mean and standard deviation of the age was $36.26 \pm 4.50$ years. Regarding marital status 287(68.0%) of the participants were married. One hundred twenty one (28.7%) of the respondents attended their primary school. The median income per month was 1500 birr which ranges from 500 to 8000 birr. The majority of respondents were rural residents which accounts, 153(63.7%). One hundred ninety (45.0%) of the respondents were Muslims followed by orthodox Christians which accounts, 133(31.5%). One hundred seventy nine (42.4%) of the study participants were government employees followed by house wives which accounts, 98 (23.2%). On bivariate analysis, being in age of 46-50 years old were found to be significantly associated with cervical precancerous lesion as compared with those who are aged 30-35 years old. (Crude OR= 1.9, 95% CI (1.25, 3.68) (Table 1).

## 3.2 Reproductive Health Characteristics

Among the study participant, 185(43.8%) of them were pregnant 1-3 times in their life time while 165(39.1%) of them has got pregnant four or more times. One hundred ninety two (45.5%) of

respondents had 1-3 number of children. More than half of the respondents, 295(69.9%) had their first pregnancy at 20-35 years of age while 69(16.4%) were got pregnant for the first time at 35 or more years of age. Regarding age at first intercourse, the majority of the respondents which accounts, 299 (70.9%) started sex at the age of 20 years or more. The mean and standard deviation of age at first intercourse was 21.35 ± 4.28. Two hundred eighty four(67.3%) of the study participants had started menarche at the age of 15 years or more while the rest 32.7% of the respondents had their first menarche at less than 15 years of age. The mean of age at menarche was 16.35 years. One hundred forty three (33.9%) of the respondents reported that they had two or more lifetime sexual partners in their life time while the rest 279(66.1%) of the respondents had one lifetime sexual partner. Among the participants 310(73.5%) of the respondents had history of abortion. With regard to self-reported HIV status, 193(45.8%),

**Table 1. Socio-demographic characteristics of women screened for cervical cancer in Dessie, Ethiopia, 2016**

| Variables | Number | Percent (%) | COR(95% CI) | P-value |
|---|---|---|---|---|
| **Age in years** | | | | **0.00*** |
| 30-35 | 65 | 15.4 | 1.00 | 1.00 |
| 36-40 | 76 | 18.0 | 0.45(0.29-2.26) | 0.4 |
| 41-45 | 131 | 31.0 | 1.32(0.85-2.50) | 0.002 |
| 46-49 | 150 | 35.6 | 1.9(1.25-3.68) | 0.0001 |
| Total | 422 | 100 | | |
| **Marital status** | | | | **0.09** |
| Single | 19 | 4.5 | 1.00 | |
| Married | 287 | 68.0 | 0.51(0.25-2.14) | 0.65 |
| Divorced | 45 | 10.7 | 0.87(0.29-2.32) | 0.29 |
| Widowed | 71 | 16.8 | 0.75(0.44-1.67) | 0.33 |
| Total | 422 | 100 | | |
| **Educational status** | | | | **0.12** |
| Illiterate | 109 | 25.8 | 1.00 | |
| Primary(1-8) | 121 | 28.7 | 0.57(0.39-1.60) | 0.35 |
| Secondary(9-12) | 99 | 23.5 | 0.76(0.44-1.90) | 0.55 |
| College and above | 93 | 22.0 | 0.35(0.11-0.87) | 0.01 |
| Total | 422 | 100 | | |
| **Monthly income** | | | | **0.65** |
| Low level (<1000) | 89 | 21.1 | 1.00 | |
| Middle level (1001-2000) | 189 | 44.8 | 0.47(0.19-1.28) | 0.05 |
| High level(>2000) | 144 | 34.1 | 0.39(0.11-1.22) | 0.06 |
| Total | 422 | 100 | | |
| **Residence** | | | | **0.26** |
| Rural | 153 | 63.7 | 1.35(0.49-2.85) | 0.28 |
| Urban | 269 | 36.3 | 1.43(0.66-3.04) | 0.32 |
| Total | 422 | 100 | | |
| **Religion** | | | | **0.30** |
| Orthodox | 133 | 31.5 | 1.00 | |
| Muslim | 190 | 45.0 | 1.22(0.53-1.96) | 0.12 |
| Protestant | 67 | 15.9 | 1.23(0.54-2.19) | 0.22 |
| Others | 32 | 7.6 | 1.12(0.62-1.85) | 0.19 |
| Total | 422 | 100 | | |
| **Occupation** | | | | **0.22** |
| House wife | 98 | 23.2 | 1.00 | |
| Merchant | 59 | 14.0 | 1.90(1.38-4.23) | 0.06 |
| Daily laborer | 26 | 6.2 | 1.54(0.72-3.12) | 0.89 |
| Government employee | 179 | 42.4 | 0.43(0.26-1.56) | 0.31 |
| Private/NGO employee | 60 | 14.2 | 0.56(0.29-1.67) | 0.50 |
| Total | 422 | | | |

139(32.9%) and 90(21.3%) of respondents were HIV positive, HIV negative and unknown status respectively. The majority of respondents, 389(92.2%) said that they had no history of HPV infection in their life time while 33(7.8%) of respondents had history of HPV infection at least once in their life time. The majority of study participants, 300(71.1%) had no history of STI while the rest 122(28.9%) acquired STI in their lifetime. Twenty nine (6.9%) of the respondents had history of smoking and the remaining 393(93.1%) had never smoke. More than half, 310(73.5%) of the respondents had no history of abortion and only 112(26.5%) of them had history of abortion. The majority of respondents, 293(69.4%) had used oral contraceptives for five or more years. Among study subjects, 403(95.5%) of participants had no family history of cervical cancer and only 19(4.5%) had family history of cervical cancer. Three hundred three (71.8%) of study participants said that they had never used alcohol and the rest 119(28.2%) had history of alcohol use. Concerning condom usage 178 (42.2%) of the respondents reported that they never used condom in their life time while only 57(13.5%) of them used condom consistently.

On bivariate analysis, having four or greater than four parity were significantly associated with cervical precancerous lesion as compare with those who did not gave birth (crude OR= 2.29, 95% CI (1.34, 5.87). Having history of abortion were significantly associated with cervical precancerous lesion as compared with those who did not have history of abortion (crude OR=1.62, 95% CI (0.98, 2.87). History of STI was significantly associated with cervical precancerous lesion (crude OR=3.52 with 95%CI (1.71, 5.45). Those women with two or more life time sexual partners were significantly associated with cervical precancerous lesion than those who have one sexual partner (crude OR=3.56 with 95% CI (2.25, 6.42). Positive HIV status were significantly associated with cervical precancerous lesion (crude OR=1.80 with 95% CI (0.35-2.18). (Refer Table 2).

### 3.3 Prevalence of Pre-cancerous Lesions

From the total of 422 respondents, only 127(30.1%) of them were ever screened for cervical cancer. From the total of respondents who had ever screened, 102(80.3%) of them had screened once in their life time and only 25(19.7%) of study subjects screened more than once. Regarding the time of screening, 117(92.1%) of respondents were screened within the last 5 years while only 10(7.9%) of them were screened before five years. From those respondents who were ever screened, only 11(8.7%) of study participants were VIA positive and the rest 116(91.3%) were VIA negative. From those who were VIA positive, 7(63.6%) were treated with cryotherapy and 4(36.4%) were referred.

More than half, 295(69.9%) of the study subjects did not ever screened for cervical cancer in their life time. Concerning the reasons for not screening, 98(33.3%) of them said that it is painful while 54(18.3%) and 37(12.5%) of them said I am health and it is expensive respectively.

Among 422 study participants who were currently screened, 390(92.4%) were VIA negative, 29(6.9%) were VIA positive and 3(0.7%) were suspicious for cancer.

### 3.4 Factors Associated with Cervical Precancerous Lesion

After bivariate analysis, variables with $P \leq 0.20$ and other variables qualified as confounders for cervical cancer associated factors were included in multivariate logistic regression models to determine their association with invasive cervical cancer or precancerous lesions as dependent variables after elimination of variables with $P>0.05$ (multivariate analysis). Study participants who were in the age group of 46-50 years were two times more likely to develop cervical precancerous lesions than those in the age group of 30-35 years. (Adjusted OR=2.30, 95% CI (1.34- 4.50)).

Respondents who gave birth of four children or more were two times more likely to acquire precancerous cervical lesions than those who never gave birth. (Adjusted OR=2.16, 95% CI (1.36-5.89)).

Starting sex before 20 years is significantly associated with cervical precancerous lesions. Study subjects who started sex before 20 years were 2.5 times more likely to have cervical precancerous lesions than those who started sexual intercourse at 20 or more years of age. (Adjusted OR=2.5, 95% CI (1.65-4.12)).

Having two or more life time sexual partners was significantly associated with cervical precancerous lesion (Adjusted OR= 3.86, 95% CI (2.37-6.69)). Respondents who were HIV positive were 1.9 times more

**Table 2. Reproductive health and behavioral characteristics of women screened for cervical cancer in gynecology OPD of Dessie referral hospital and FGAE, 2016**

| Variables | Number | Percent | COR(95% CI) | P-value |
|---|---|---|---|---|
| **Number of pregnancy** | | | | **0.29** |
| 0 | 72 | 17.1 | 1.00 | |
| 1-3 | 185 | 43.8 | 0.53(0.24-1.77) | 0.29 |
| ≥4 | 165 | 39.1 | 0.45(0.22-1.49) | 0.01 |
| Total | 422 | 100 | | |
| **Number of children born/parity** | | | | **0.02*** |
| 0 | 72 | 17.1 | 1.00 | |
| 1-3 | 192 | 45.5 | 0.66(0.34-1.58) | 0.08 |
| ≥4 | 158 | 37.4 | 2.29(1.34-5.87) | 0.16 |
| Total | 422 | 100 | | |
| **Age at first pregnancy** | | | | **0.69** |
| < 20 years | 58 | 13.7 | 1.00 | |
| 20-35 years | 295 | 69.9 | 1.24(0.55-2.13) | 0.59 |
| > 35 years | 69 | 16.4 | 0.75(0.36-1.86) | 0.84 |
| Total | 422 | 100 | | |
| **Age at first intercourse** | | | | **0.04*** |
| <20 years | 123 | 29.1 | 2.19(1.51-3.89) | 0.04 |
| ≥20 years | 299 | 70.9 | 1.00 | |
| Total | 422 | | | |
| **Age at first menarche** | | | | **0.02*** |
| <15 | 138 | 32.7 | 1.00 | |
| ≥15 | 284 | 67.3 | 0.32(0.12-0.79) | 0.03 |
| Total | 422 | | | |
| **Number of sexual partners** | | | | **0.00*** |
| 1 | 279 | 66.1 | 1.00 | |
| 2 or more | 143 | 33.9 | 3.56(2.25-6.42) | 0.00* |
| Total | 422 | 100 | | |
| **Self-Reported HIV Status** | | | | **0.03*** |
| Negative | 193 | 45.8 | 1.00 | |
| Positive | 139 | 32.9 | 1.80(0.35-2.18) | 0.03* |
| Unknown | 90 | 21.3 | 0.90(0.54-5.28) | 0.9 |
| Total | 422 | 100 | | |
| **History of HPV infection** | | | | **0.00*** |
| Yes | 33 | 7.8 | 2.30(0.65-4.78) | 0.00* |
| No | 389 | 92.2 | 1.00 | |
| Total | 422 | 100 | | |
| **History of STI** | | | | **0.04*** |
| Yes | 122 | 28.9 | 3.52(1.71-5.45) | 0.04* |
| No | 300 | 71.1 | 1.00 | |
| Total | 422 | 100 | | |
| **History of smoking** | | | | **0.03*** |
| Yes | 29 | 6.9 | 1.80(0.68-3.91) | 0.03* |
| No | 393 | 93.1 | 1.00 | |
| Total | 422 | 100 | | |
| **History of abortion** | | | | **0.02*** |
| Yes | 112 | 26.5 | 1.62(0.98-2.87) | 0.04* |
| No | 310 | 73.5 | 1.00 | |
| Total | 422 | 100 | | |
| **History of prolonged oral contraceptive use** | | | | **0.3** |
| <5 years | 293 | 69.4 | 1.45(0.79-2.91) | **0.3** |
| ≥5 years | 129 | 30.6 | 1.00 | |

| Variables | Number | Percent | COR(95% CI) | P-value |
|---|---|---|---|---|
| Total | 422 | 100 | | |
| **Family history of cervical cancer** | | | | **0.12** |
| Yes | 19 | 4.5 | 1.72(0.66-3.89) | 0.12 |
| No | 403 | 95.5 | 1.00 | |
| Total | 422 | 100 | | |
| **History of alcohol use** | | | | **0.75** |
| Yes | 119 | 28.2 | 1.5(0.86-2.91) | 0.75 |
| No | 303 | 71.8 | 1.00 | |
| Total | 422 | 100 | | |
| **Condom use** | | | | **0.04** |
| Always | 57 | 13.5 | 1.00 | |
| Sometimes | 187 | 44.3 | 0.22(0.15-1.56) | 0.04 |
| Never | 178 | 42.2 | 0.45(0.19-1.62) | 0.14 |
| Total | 422 | 100 | | |

**Table 3. Prevalence of pre-cancerous lesions (VIA positive) and invasive cervical cancer according to different characteristics in gynecology OPD of Dessie referral hospital and FGAE, 2016**

| Variables | Number | Percent | COR(95% CI) | P-value |
|---|---|---|---|---|
| **Ever Screened for cancer of the cervix** | | | | |
| Yes | 127 | 30.1 | 1.33(0.65-2.89) | 0.15 |
| No | 295 | 69.9 | 1.00 | |
| Total | 422 | 100 | | |
| **Screening frequency (for those who said yes)** | | | | |
| Once | 102 | 80.3 | 1.00 | |
| More than once | 25 | 19.7 | 0.55(0.24-1.95) | 0.21 |
| Total | 127 | 100 | | |
| **Last time you screened (for those who ever screened)** | | | | |
| Within 5 years | 117 | 92.1 | 0.23(0.19-2.77) | 0.41 |
| More than 5 years | 10 | 7.9 | 0.52(0.22-3.19) | 0.62 |
| Total | 127 | 100 | | |
| **VIA result at that time (for those who ever screened)** | | | | |
| Positive | 11 | 8.7 | 1.41(1.27-2.96) | 0.99 |
| Negative | 116 | 91.3 | 1.0 | |
| Total | 127 | 100 | | |
| **Intervention provided(for positive results only, N=)** | | | | |
| Treated with Cryotherapy | 7 | 63.6 | 2.94(1.89-4.48) | 0.77 |
| Referred | 4 | 36.4 | 1.00 | |
| Total | 11 | 100 | | |
| **Reasons for not screening(for those who did not ever screened)** | | | | |
| It is painful | 98 | 33.3 | 1.11(0.59-3.22) | 0.19 |
| I am healthy | 54 | 18.3 | 1.85(0.98-3.77) | 0.56 |
| My husband refused | 21 | 7.1 | 1.9(0.99-4.47) | 0.97 |
| It is expensive | 37 | 12.5 | 0.65(0.23-3.39) | 0.18 |
| It will cause injury to me | 27 | 9.2 | 1.57(0.75-3.92) | 0.26 |
| I was not informed about the service | 13 | 4.4 | 0.91(0.39-4.13) | 0.9 |
| The health care provider is not friendly | 19 | 6.4 | 1.12(0.24-2.87) | 0.15 |
| The service is not available in my resident area | 26 | 8.8 | 1.00 | 0.19 |
| Total | 295 | | | |
| **Current screening/VIA result for pre-cancer lesions** | | | | |
| Positive | 29 | 6.9 | 1.8(0.49-3.55) | 0.11 |
| Negative | 390 | 92.4 | 1.00 | |
| Suspicious for cancer | 3 | 0.7 | 1.46(0.67-4.21) | 0.29 |
| Total | 422 | 100 | | |

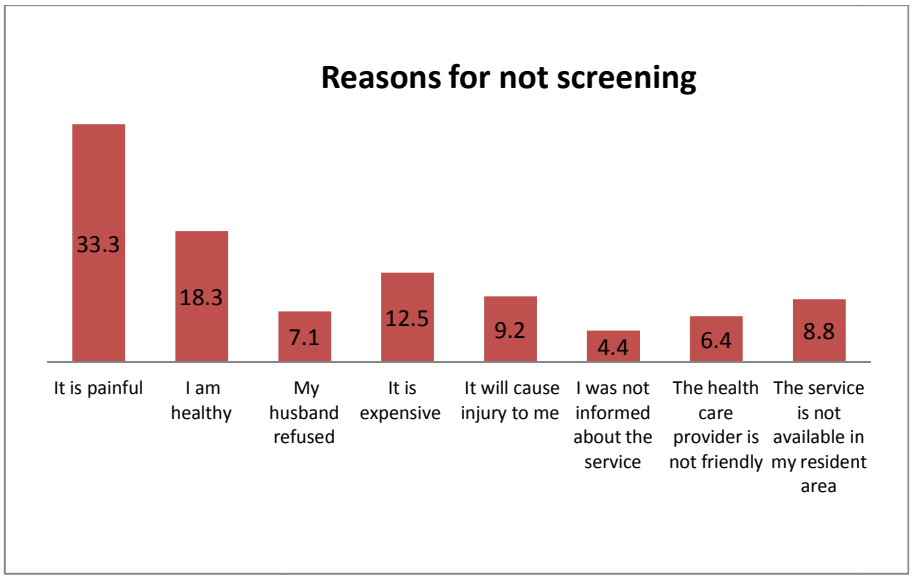


**Fig 1. Reasons for not screening**

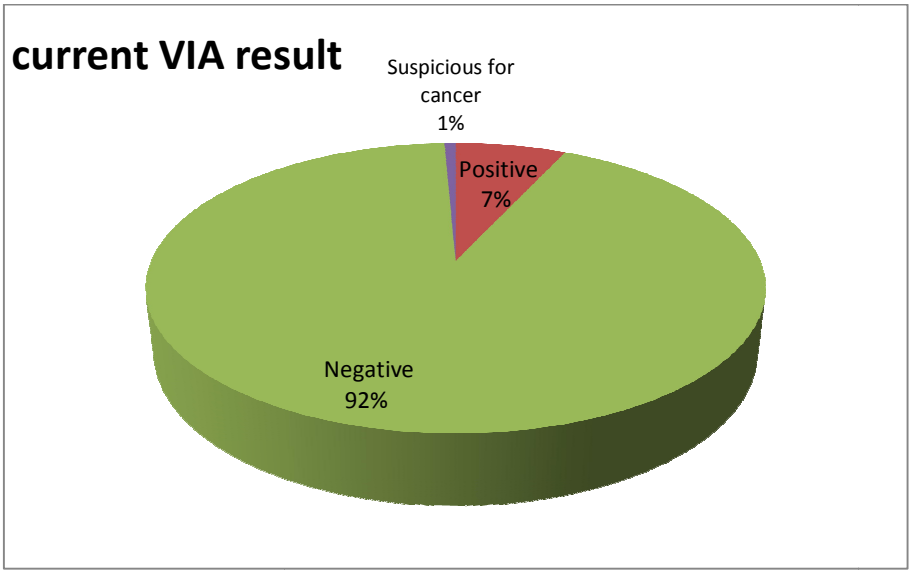


**Fig. 2. Current VIA result of respondents**

likely to develop precancerous cervical lesions. (Adjusted OR= 1.99, 95% CI (0.44-2.25)). Having history of HPV infection was significantly associated with cervical precancerous lesions. (Adjusted OR= 2.5, 95% CI (0.75-4.95)). Women who had history of sexual transmitted infection were three times more likely to have cervical precancerous lesion than those who did not have history of sexually transmitted infections. (Adjusted OR = 3.43, 95% CI (1.65-5.35)). Women who smoke cigarettes were two times more risk to develop cervical precancerous lesions than those who did not smoke. (Adjusted OR = 2.01, 95% CI (0.78-4.11)). History of abortion was positively associated with developing cervical precancerous lesions. (Adjusted OR = 1.55, 95% CI (0.88-3.21)). Having family history of cervical cancer increases the risk of developing cervical precancerous lesions by 1.85 times. (AOR=1.85, 95% CI (0.77-3.99)). (Refer Table 4).

**Table 4. Multi-variable analysis of selected variables with cervical precancerous lesions among study participants in gynecology OPD of Dessie referral hospital and FGAE, 2016**

| Variables | Number | Percent | COR(95% CI) | AOR(95% CI) |
|---|---|---|---|---|
| **Age in years** | | | | |
| 30-35 | 65 | 15.4 | 1.00 | 1.00 |
| 36-40 | 76 | 18.0 | 0.45(0.29-2.26) | 0.90(0.32-2.59) |
| 41-45 | 131 | 31.0 | 1.32(0.85-2.50) | 0.002 |
| 46-50 | 150 | 35.6 | 1.9(1.25-3.68) | 2.30(1.34-4.50)** |
| Total | 422 | 100 | | |
| **Marital status** | | | | |
| Single | 19 | 4.5 | 1.00 | 1.00 |
| Married | 287 | 68.0 | 0.51(0.25-2.14) | 0.31(0.11-3.23) |
| Divorced | 45 | 10.7 | 0.87(0.29-2.32) | 0.69(0.18-2.30) |
| Widowed | 71 | 16.8 | 0.75(0.44-1.67) | 0.89(0.52-1.85) |
| Total | 422 | 100 | | |
| **Educational status** | | | | |
| Illiterate | 109 | 25.8 | 1.00 | 1.00 |
| Primary(1-8) | 121 | 28.7 | 0.57(0.39-1.60) | 0.45(0.27-1.87) |
| Secondary(9-12) | 99 | 23.5 | 0.76(0.44-1.90) | 0.70(0.33-2.21) |
| College and above | 93 | 22.0 | 0.35(0.11-0.87) | 0.12(0.11-0.75) |
| Total | 422 | 100 | | |
| **Number of children born/parity** | | | | |
| 0 | 72 | 17.1 | 1.00 | 1.00 |
| 1-3 | 192 | 45.5 | 0.66(0.34-1.58) | 0.77(0.25-1.99) |
| ≥4 | 158 | 37.4 | 2.29(1.34-5.87) | 2.16(1.36-5.89)** |
| Total | 422 | 100 | | |
| **Age at first intercourse** | | | | |
| <20 years | 123 | 29.1 | 2.19(1.51-3.89) | 2.5(1.65-4.12)** |
| ≥20 years | 299 | 70.9 | 1.00 | 1.00 |
| Total | 422 | | | |
| **Age at first menarche** | | | | |
| <15 | 138 | 32.7 | 1.00 | 1.00 |
| ≥15 | 284 | 67.3 | 0.32(0.12-0.79) | 0.41(0.19-0.89) |
| Total | 422 | | | |
| **Number of sexual partners** | | | | |
| 1 | 279 | 66.1 | 1.00 | 1.00 |
| 2 or more | 143 | 33.9 | 3.56(2.25-6.42) | 3.86(2.37-6.69)** |
| Total | 422 | 100 | | |
| **Self-Reported HIV Status** | | | | |
| Negative | 193 | 45.8 | 1.00 | 1.00 |
| Positive | 139 | 32.9 | 1.80(0.35-2.18) | 1.99(0.44-2.25)** |
| Unknown | 90 | 21.3 | 0.90(0.54-5.28) | 0.96(0.55-5.45) |
| Total | 422 | 100 | | |
| **History of HPV infection** | | | | |
| Yes | 33 | 7.8 | 2.30(0.65-4.78) | 2.5(0.75-4.95)** |
| No | 389 | 92.2 | 1.00 | 1.00 |
| Total | 422 | 100 | | |
| **History of STI** | | | | |
| Yes | 122 | 28.9 | 3.52(1.71-5.45) | 3.43(1.65-5.35)** |
| No | 300 | 71.1 | 1.00 | 1.00 |
| Total | 422 | 100 | | |
| **History of smoking** | | | | |
| Yes | 29 | 6.9 | 1.80(0.68-3.91) | 2.01(0.78-4.11)** |
| No | 393 | 93.1 | 1.00 | 1.00 |

| Variables | Number | Percent | COR(95% CI) | AOR(95% CI) |
|---|---|---|---|---|
| Total | 422 | 100 | | |
| **History of abortion** | | | | |
| Yes | 112 | 26.5 | 1.62(0.98-2.87) | 1.55(0.88-3.21)** |
| No | 310 | 73.5 | 1.00 | 1.00 |
| Total | 422 | 100 | | |
| **Family history of cervical cancer** | | | | |
| Yes | 19 | 4.5 | 1.72(0.66-3.89) | 1.85(0.77-3.99)** |
| No | 403 | 95.5 | 1.00 | 1.00 |
| Total | 422 | 100 | | |
| **Condom use** | | | | |
| Always | 57 | 13.5 | 1.00 | 1.00 |
| Sometimes | 187 | 44.3 | 0.22(0.15-1.56) | 0.32(0.11-1.89) |
| Never | 178 | 42.2 | 0.45(0.19-1.62) | 0.34(0.23-1.74) |
| Total | 422 | 100 | | |

## 4. DISCUSSION

In this study, respondents who were in the age group of 46-50 years were two times more likely to develop cervical precancerous lesions than those in the age group of 30-35 years. (Adjusted OR = 2.30, 95% CI (1.34- 4.50)). The finding of this study is similar with the study done on Prevalence and Predictors of Pap Smear among HIV-Positive and Negative Women in Cervical Cancer Screening at Debre Markos Referral Hospital, which showed that the highest prevalence of cervical lesions (25.0%) was observed in older age women (>45 years of old). The finding of this study was also in-line with the study done by Emese Meszaros, Ohio State University which stated that being in age group of 46–55 years was risk factor for high grade squamous intraepithelial lesions compared with the 25–35 age groups [7].

In this study 287(68.0%) of the participants were married and 121 (28.7%) of the respondents attended their primary school. The same study done by Emese Meszaros, Ohio State University also showed that the higher educated and married women have decreased risk of developing cervical cancer which is similar to this study [8]. This could be justified that women with high level of education may have high level of awareness on risks and preventions of cervical cancer and married women may not be exposed to multiple sexual partners.

The finding of this study was also congruent with the study conducted in Canada which showed that no significant links were found between cervical precancerous lesions and family income, number of pregnancies, currently being pregnant, or being oral contraceptive user [9].

This study showed that there was no association between cervical screening and residence (p=0.26). But a cross sectional study done in Uganda reported that Living in semi urban or urban areas was significantly associated with having undergone cervical cancer screening [COR = 2.54 (95% CI: 1.37–4.71), p = 0.003] [10]. This difference might be due to socio-demographic differences in the two areas.

This study showed that respondents who gave birth of four children or more were two times more likely to acquire precancerous cervical lesions than those who never gave birth. (Adjusted OR=2.16, 95% CI (1.36-5.89)). The finding of this study was similar with the case control study done in Southwest Ethiopia which showed that having more than 4 children and old age were significantly associated with the development of invasive cervical cancer. Another similar study done in Debre Markos referral hospital supports this study which showed that women with high parity (parity greater than four) were ten folds more likely to develop cervical pre-cancerous lesions (AOR: 10.9, 95% CI; 4.2 − 16.8, $p < 0.001$) than women with parity lower than three [7,11].

Study subjects who started sex before 20 years were 2.5 times more likely to have cervical precancerous lesions than those who started sexual intercourse at 20 or more years of age. (Adjusted OR=2.5, 95% CI (1.65-4.12)). The finding was in congruent with the study done in United States and Venezuela which stated that beginning sexual intercourse at age 18 or younger accounted for a 3.9 times increased risk for cervical cancer and is a significant finding ( p < 0.01). Another study done in Izmir also showed that starting to have intercourse in early ages is considered as a significant risk for cervical

cancer and it is reported that cervical infections caused mostly by HPV develop with the first intercourse Louie et al. Cross-sectional study in Jimma, Ethiopia also supports this study which shows that initiation of sexual intercourse before the age of 16 years was a risk factor for developing cervical precancerous lesion [8,12].

The finding of this study showed that having two or more life time sexual partners was significantly associated with cervical precancerous lesion (Adjusted OR = 3.86, 95% CI (2.37-6.69)). Respondents who were HIV positive were 1.9 times more likely to develop precancerous cervical lesions. (Adjusted OR= 1.99, 95% CI (0.44-2.25)). This finding is in congruent with the study done in German 2015, which reported that sexually active adolescents may be at high risk of developing cervical dysplasia because of earlier initiation of sexual intercourse and having multiple sexual partners. The finding of this study was also similar with a case control study done in Zimbabwe which suggest that having more than one sexual partner, being HIV positive, early sexual debut (<15years), history of any form of STI and being single were significant risk factors for cervical precancerous lesion. Another study done in southwest Ethiopia showed that a wife with more than one husband and husband with more than one wife in lifetime was risk factor for invasive cervical cancer but history of STI and early age at first sex not significantly associated. A study done at Debre Markos Referral Hospital showed the prevalence of cervical pre-cancerous lesions was high (51.9 %) among HIV+ women than HIV negative women (AOR 3.2, 95% CI: (1.0 − 10, $p = 0.048$)) [7,13].

Having history of HPV infection was significantly associated with cervical precancerous lesions. (Adjusted OR= 2.5, 95% CI (0.75-4.95)). Women who had history of sexual transmitted infection were three times more likely to have cervical precancerous lesion than those who did not have history of sexually transmitted infections. (Adjusted OR=3.43, 95% CI (1.65-5.35)). Many studies showed that almost 100% of women with a diagnosis of cervical cancer have been found to have had an HPV infection (American Cancer Society, 2010).

In this study, women who smoke cigarettes were two times more risk to develop cervical precancerous lesions than those who did not smoke. (Adjusted OR=2.01, 95% CI (0.78-4.11)). This finding is similar with the study done among women in the United States and Venezuela which indicated significant increase in risk for cervical cancer among current cigarette smokers ($p< 0.05$). A Study conducted on cervical cancer and screening among rural and urban female healthcare practitioners in the Democratic People's Republic of Korea supports this study which indicated that smoking was identified as risk factors for cervical cancer (74% rural, 94% urban, $p<0.05$) [14].

This study showed that alcohol has no significant association with cervical lesion development. Similarly, a study done in Debre Markos showed that smoking and alcohol consumption were not associated with the development of precancerous lesions. But other research works indicated that it has an indirect role (increase likelihood of multiple sexual partners). One study found that alcohol use, especially during the time of last sexual intercourse, was strongly associated with an increased likelihood of multiple sexual partners Elizabeth et al. [15].

In this study, history of abortion was positively associated with developing cervical precancerous lesions. (Adjusted OR = 1.55, 95% CI (0.88-3.21)). The finding is supported by the study reported from Nigeria which shows having five or more abortions increase cervical cancer screening positivity and multiple pregnancies shows no association [16].

This study showed that women having family history of cervical cancer were 1.85 times more likely to develop cervical precancerous lesions when compared to those women who had no family history of cervical cancer. (AOR=1.85, 95% CI (0.77-3.99)). Similarly, the study reported from Nigeria shows cervical cancer runs in some families; women with history of her mother or sister with cervical cancer, the chance of developing the disease is 2 to 3 times than women without the family history [17].

In this study 30.1% of the respondents had ever screened for cervical cancer which is higher than the study done in Uganda which indicated that only 4.8% of respondents had ever screened for cervical cancer. The inconsistency may occur due to time difference in which the two studies were conducted. This study was conducted recently while women could get information about cervical cancer screening.

The proportion of cervical precancerous lesions in this study was 6.9% and 0.7% were suspicious for cancer**.** In multivariate regression analysis

increased age(≥46), high parity(≥4), first intercourse at <20 years, having ≥ two sexual partners, positive HIV status, History of HPV infection, History of STI, Smoking, History of abortion, nonuse of condom and family history of cervical cancer were significantly associated with the development of cervical precancerous lesions. Similarly, a descriptive cross sectional and analytical study done in Rwanda showed that pre-cancer lesions (VIA positive) were most prevalent in participants who had first pregnancy before 20 years old, in participants who had first sexual intercourse before age 20, those who are HIV positive and those who had more than five sexual partner. Another study done among Hawassa university students also supported this study which showed that three main risk factors for development of cervical cancer were multiple sexual partners (85.5%), early sexual intercourse (80.1%) and HPV infection (69.1%) [18].

The findings of this study showed no association between prolonged use of oral contraceptive pills and cervical lesions which is in-line with a case control study done in Nigeria which shows that there is no significant association between hormonal contraceptives use and abnormal cervical epithelial cytology [19]. In contrary, this study was inconsistent with the study done in Uganda which reported that prolonged use of family planning pills and injections were significantly associated with development of cervical lesions. Another study conducted in Debre Markos referral hospital also contradicts this study which said that OCP users for more than five years were found to be at higher risk of developing cervical cancer (AOR: 11.9, 95% CI: 2.1 − 16.7, $p = 0.02$) [7,20]. The inconsistence may occur due to difference in sample size and methodological difference.

More than half, 295(69.9%) of the study subjects did not ever screened for cervical cancer in their life time. The common reasons for not screening were thinking the procedure is painful, perception that it is not necessary for me (I am health) and it is expensive.

## 5. CONCLUSION

This study tried to assess the proportions of cervical pre-cancerous lesions and associated factors in the study area. The proportion of cervical precancerous lesions in the study area was 6.9%. In multivariate regression analysis increased age(≥46), high parity(≥4), first intercourse at <20 years, having ≥ two sexual partners, positive HIV status, History of HPV infection, History of STI, Smoking, History of abortion, nonuse of condom and family history of cervical cancer were significantly associated with the development of cervical precancerous lesions. From the total 422 study participants, only 127(30.1%) of them were ever screened for cervical cancer one or more times in their life time while the rest 295(69.9%) of the study subjects did not ever screened for cervical cancer in their life time. Concerning the reasons for not screening, 98(33.3%) of them said that it is painful while 54(18.3%) and 37(12.5%) of them said I am health and it is expensive respectively. This indicates poor awareness on the importance of early screening and treatment of cervical pre-cancerous lesions.

## 6. RECOMMENDATIONS

Depending on the findings of this study, the following recommendations were forwarded.

**Federal Ministry of Health:**

- Should make the screening service accessible in every hospital and health center so every woman can easily access it.
- Should disseminate information regarding prevention and treatment of cervical precancerous lesions through mass media.
- Design policy and strategy for the prevention and control of cervical precancerous lesions.

**Zonal Health Office:**

- Should arrange Awareness creation programs on prevention and treatment of cervical precancerous lesions so that women can use the service.
- Make the service free or provide it at a minimum cost.
- Train more professionals to provide the service.

**Health Professionals:**

- Should encourage eligible clients to be screened and teach about the prevention and treatment options.
- Should provide respectful and compassionate care during screening.
- Should encourage condom use for sexually active women.

**Researchers:**

- Researchers could be encouraged to do further study on this area especially on risk factors associated with cervical cancer with increased sample size and more strong study design.

## CONSENT

Written consent was obtained from each study participants. The right of the respondents to refuse to answer for any or all questions was respected.

## ETHICAL APPROVAL

The study was approved by the Ethical Review Board of Wollo University, college of Medicine and Health Sciences and a cooperation letter was obtained from Dessie referral hospital administrative office.

## FUNDING

All cost related to this research was covered by Wollo University research and community service coordinating office.

## ACKNOWLEDGEMENTS

First of all, we would like to express our sincere thanks to the Almighty God for His love, forgiveness and generosity.

It gives great pleasure to present our sincere thanks for the support we got from the administrative staffs of Dessie referral hospital and Family guidance association of Ethiopia.

Our thanks also go to Wollo University, College of Medicine and Health Sciences, coordinating office for allowing us to do this research work.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. American Cancer Society. Cancer prevention & early detection facts & figures 2013. Atlanta, Ga: American Cancer Society; 2013.
2. Pathfider International, combating cervical cancer in Ethiopia, Addis Tesfa, Pathfider International, Addis Ababa, Ethiopia; 2010. Available:http://www.pathfinder.org publications-tools/pdfs/Combating Cervical-Cancer-in-Ethiopia.pdf.
3. American Cancer Society. Detailed guide: Cervical cancer. Available:http://www.cancer.org/Cancer/CervicalCancer/DetailedGuide/index on March 28, 2013.
4. Howlader N, Noone AM, Krapcho M, et al, eds. SEER cancer statistics review, 1975–2011. Bethesda, MD: National Cancer Institute; 2013. Available:http://seer.cancer.gov/csr/1975_ 2011.
5. Moyer VA. Screening for cervical cancer: U.S. Preventive services task force recommendation statement. Ann Intern Med. 2012;156:880–91.
6. Saslow D, Solomon D, Lawson HW, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. Am J Clin Pathol. 2012;137:516–42.
7. Prevalence and predictors of Pap smear cervical epithelial cell abnormality among HIV-positive and negative women attending gynecological examination in cervical cancer screening center at Debre Markos referral hospital, East Gojjam, Northwest Ethiopia.
8. Fisher JW, Brundage SI. The challenge of eliminating cervical cancer in the United States: A story of politics, prudishness, and prevention. Women & Health. 2009;49(2-3),246-261. DOI:10.1080/03630240902915101
9. Anderson TA, Schick V, Herbenick D, Dodge B, Fortenberry JD. A study of human Papilloma virus on vaginally inserted sex toys, before and after cleaning, among women who have sex with women and men. Sex Transm Infect; 2014.
10. John J. Knowledge, attitude, practice and perceived barriers towards screening for cervical cancers among women aged 18 years and above, in songea urban, Ruvuma Tanzania [Degree of Master of Medicine in Obstetrics and Gynaecology], Muhimbili University of Health and Allied Sciences, 2011.
11. World Health Organization, Institut Catal`a d'Oncologia: Human Papillomavirus and Related Cancers in Ethiopia, Fact Sheet;

2013-2014.
Available:http://www.hpvcentre.net/statistics/reports/ ETH.pdf.
12. Shah V, Vyas S, Singh A, M Shrivastava M. Awareness and knowledge of cervical cancer and its prevention among the nursing staff of a tertiary health institute in Ahmedabad, Gujarat, India. Ecancer Medical Science. 2012;6(270).
13. Adageba RK, Danso KA, Ankobea FK, Kolbilla DZ, Opoku P. Knowledge of cervical cancer and patronage of cervical cancer screening services among female health workers in Kumasi, Ghana. African Journal of Haematology and Oncology. 2011;2(1):157–161.
14. Amosu AM, Degun AM, Babalola AO, Thomas MA. Level of specific knowledge, awareness, perception and screening behavior regarding carcinoma of the cervix among Rural women in Iwo local government area, Osun State, Nigeria. Annals of Biological Research. 2011;2(2): 206–221.
15. Ombech Elizabeth A, Muigai Anne WT, Peter W. Awareness of cervical cancer risk factors and practice of Pap smear testing among female primary school teachers in Kasarani division, Nairobi Kenya. African Journal of Health Sciences. 2012;21(2): 121–132.
16. Oche MO, Kaoje AU, Gana G, Ango JT. Cancer of the cervix and cervical screening Current knowledge, attitude and practices of female health workers in Sokoto, Nigeria. International Journal of Medicine and Medical Sciences. 2013;5(4):184–190.
17. Awodele O, Adeyomoye AAA, Awodele DF, Kwashi V, Awodele IO, DC Dolapo DC. A study on cervical cancer screening amongst nurses in Lagos University Teaching Hospital, Lagos, Nigeria," Journal of Cancer Education. 2011;26(3): 497–504.
18. Nilaweera RIW, Perera S, Paranagama N, AS Anushyanthan AS. Knowledge and practices on breast and cervical cancer screening methods among female health care workers: a Sri Lankan experience," Asian Pacific Journal of Cancer Prevention. 2012;13(4):1193–1196.
19. Arulogun OS, Maxwell OO. Perception and utilization of cervical cancer screening services among female nurses in University College Hospital, Ibadan, Nigeria. Pan African Medical Journal. 2012;11(69).
20. Aswathy S, MA Quereshi MA, Kurian B, Leelamoni K. Cervical cancer screening: current knowledge & practice among women in a rural population of Kerala, India. Indian Journal of Medical Research, 2012;136(2):205–210.



*Peer-review history:*
*The peer review history for this paper can be accessed here:*
*http://www.sdiarticle3.com/review-history/45462*