

1 **Original Research Article**

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3 **PROPORTIONS OF PRE-CANCEROUS CERVICAL LESIONS AND ITS**  
4 **ASSOCIATED FACTORS AMONG WOMEN CLIENTS IN THE AGE**  
5 **GROUP OF 30-49yrs IN GYNECOLOGY WARD OF DESSIE REFERRAL**  
6 **HOSPITAL AND FGAE, NORTH-EAST ETHIOPIA, 2016**

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10 **Abstract**

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

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

23 **Methods:-**An institution based cross-sectional study design involving quantitative method was employed.  
24 For the quantitative survey 422 women in the age group of 30-49 were participated. The sample size was  
25 computed by using single population proportion formula for finite population with 95% confidence level,  
26 prevalence of 50% and marginal error of 2%. Pretested and structured questionnaire was used in order to

27 facilitate reliable response. Questionnaires for each item were adapted from previously done similar  
28 studies. Pretest was done on five percent of study population.

## 29 **Result**

30 Among 422 study participants who were currently screened, 390(92.4%) were VIA negative,  
31 29(6.9%) were VIA positive and 3(0.7%) were suspicious for cancer. The majority (69.9%) of  
32 the study subjects did not ever screen for cervical cancer in their life time. Concerning the  
33 reasons for not screening, 98(33.3%) of them said that it is painful while 54(18.3%) and  
34 37(12.5%) of them said I am health and it is expensive respectively.

## 35 **Conclusion**

36 The proportion of cervical precancerous lesion was 6.9%. In multivariate regression analysis  
37 increased age( $\geq 46$ ), high parity( $\geq 4$ ), first intercourse at  $< 20$  years, having  $\geq$  two sexual partners,  
38 positive HIV status, History of HPV infection, History of STI, Smoking, History of abortion,  
39 nonuse of condom and family history of cervical cancer were significantly associated with the  
40 development of cervical precancerous lesions.

41 **Key words:** Cervical lesions, Dessie Town, cervical cancer, VIA positive, VIA negative

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## 44 **Introduction**

45 Cervical cancer is a type of cancer that starts in cells lining of the cervix. These cells do not  
46 suddenly change into cancer. Instead, the normal cells of the cervix gradually develop pre-  
47 cancerous changes that turn into cancer. Eighty-three percent of new cases of cervical cancer and  
48 85% of related deaths occur in resource-poor countries; affecting poor, vulnerable, and  
49 disenfranchised women at the prime of life. Cervical cancer is the second most common cancer  
50 in the world and the third common cause of deaths from cancer in women. Each year, an  
51 estimated 530,000 new cases of cervical cancer are diagnosed globally and more than 270,000  
52 women die from it. Of the estimated deaths from cervical cancer, more than 85% occur in  
53 developing countries. It is a major cause of morbidity and mortality among women in resource-  
54 poor settings, especially in Africa. In Ethiopia, cervical cancer is the second most common  
55 cancer following breast cancer and the leading cause of death from cancer. Annually, an  
56 estimated number of 4648 women develop the cancer and 3,235 die from it. The majority of  
57 cancers (over 80%) in sub-Saharan Africa are detected in late stages, predominantly due to lack  
58 of information about cervical cancer and prevention services. Late-stage disease is associated  
59 with low survival rates after surgery or radiotherapy. In addition, these treatment modalities may  
60 be lacking altogether, or too expensive and inaccessible, for many women in low resource  
61 countries. Cervical cancer is potentially preventable, and there are effective screening and  
62 treatment programs that can lead to a significant reduction in the morbidity and mortality  
63 associated with this cancer. Reports of trends in cervical cancer mortality from less developed  
64 countries have been limited by poor data quality and inaccurate population estimates.

65 According to the 2009 WHO report, the age-adjusted incidence rate of cervical cancer in  
66 Ethiopia was 35.9 per 100,000 patients with 7619 annual number of new cases and 6081 deaths  
67 (79.8%) every year. This shows that there is a very high case fatality rate. Despite this fact, very  
68 few women receive screening services in Ethiopia. Therefore, this study was aimed to determine  
69 the proportion of pre-cancerous cervical lesions and associated factors in the study area.

## 70 **General objective**

71

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

## 75 **Methods and Materials**

### 76 **Study design and period**

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

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### 82 **Sample size estimation**

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

### 85 **Instruments and Measurements**

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

### 93 **Data collection procedures**

94 Semi structured questionnaire was employed to collect data. Five BSc Nurses who were  
95 certified in cervical screening and working in Gynecology ward of Dessie referral hospital and  
96 FGAE were recruited as data collectors' and two MSC supervisors were assigned. Un-lubricated  
97 bivalve speculum was inserted into the vagina and the cervix was made visualized using a lamp  
98 to identify the Squamo-Columnar Junction (SCJ). After cleaning away any excess mucus using a  
99 cotton swab, a three- five percent acetic acid solution was applied to the cervix for visual  
100 inspection with acetic acid. Findings were evaluated one minute after application. Precancerous

101 lesions were defined as being dense aceto-white lesions with well-defined margins observed  
102 within the vicinity of the transformation zone originating from the SCJ, or if the whole cervix or  
103 cervical growth turned white. A suspicion of invasive cervical cancer was defined as any cervical  
104 ulcer or growth being observed. Results of VIA was classified as negative, positive, or  
105 suspicious for Invasive Cervical Cancer (ICC) according to the International Agency for  
106 Research on Cancer (IARC) training manual. Screening was also done by pap smear. Sample  
107 was sent to laboratory and wait for the result. Whenever there is uncertainty of the screening  
108 result the nurses were consulted an experienced gynecologist and he/she confirmed the  
109 diagnosis. Positive cases who were eligible was treated with cryotherapy at single visit (see and  
110 treat approach). Positive VIA cases who were eligible for cryotherapy includes no suspicious for  
111 cancer, entire extent of the lesion can be seen, aceto-white lesion occupies less than 75% of the  
112 cervix, and lesion does not extend beyond the cervix, not pregnant and no cervicitis. The data  
113 collection period was for ninety (90) days. Data collectors were trained for one day on questions  
114 included in the questionnaire, on screening techniques, purpose of the study, and importance of  
115 privacy, discipline and approach to the clients and confidentiality of the respondents. Before  
116 conducting the main study, pretest was conducted on five percent of the total sample size (in  
117 Dessie health center) which were not included in the main study. Based on the result, data  
118 collectors were reoriented and the questionnaire was modified accordingly.

### 119 **Data quality control**

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

### 129 **Data Processing and Analysis**

130 The questionnaire was checked for completeness and consistency and entered and edited in the  
131 computer for statistical analysis. Data was entered in to Epi Info version 3.5.1 database.

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

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### 141 **Ethical consideration**

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

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

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## 5. RESULTS

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

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### 156 **5.1. Socio-demographic characteristics**

157 Among the study participants 150(35.60%) of the respondents were found to be in the age group  
158 of 46-49 years old and the mean and standard deviation of the age was  $36.26 \pm 4.50$  years.

159 Regarding marital status 287(68.0%) of the participants were married. One hundred twenty one  
160 (28.7%) of the respondents attended their primary school. The median income per month was  
161 1500 birr which ranges from 500 to 8000 birr. The majority of respondents were rural residents

162 which accounts, 153(63.7%). One hundred ninety (45.0%) of the respondents were Muslims  
 163 followed by orthodox Christians which accounts, 133(31.5%). One hundred seventy nine  
 164 (42.4%) of the study participants were government employees followed by house wives which  
 165 accounts, 98 (23.2 %). On bivariate analysis, being in age of 46-50 years old were found to be  
 166 significantly associated with cervical precancerous lesion as compared with those who are aged  
 167 30-35 years old. (Crude OR= 1.9, 95 % CI (1.25, 3.68) (Table 1).

168  
 169 **Table 1: Socio-demographic characteristics of women screened for cervical cancer in Dessie,**  
 170 **Ethiopia, 2016.**

Variables	Number	Percent (%)	COR(95% CI)	P-value
<b>Age in years</b>				<b>0.00*</b>
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		
<b>Marital status</b>				<b>0.09</b>
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		
<b>Educational status</b>				<b>0.12</b>
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		
<b>Monthly income</b>				<b>0.65</b>
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		
<b>Residence</b>				<b>0.26</b>
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		
<b>Religion</b>				<b>0.30</b>
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		
<b>Occupation</b>				<b>0.22</b>
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			

## 171 Reproductive health characteristics

172 Among the study participant, 185(43.8%) of them were pregnant 1-3 times in their life time  
173 while 165(39.1%) of them has got pregnant four or more times. One hundred ninety two (45.5%)  
174 of respondents had 1-3 number of children. More than half of the respondents, 295(69.9%) had  
175 their first pregnancy at 20-35 years of age while 69(16.4%) were got pregnant for the first time at  
176 35 or more years of age. Regarding age at first intercourse, the majority of the respondents which  
177 accounts, 299 (70.9%) started sex at the age of 20 years or more. The mean and standard  
178 deviation of age at first intercourse was  $21.35 \pm 4.28$ . Two hundred eighty four(67.3%) of the  
179 study participants had started menarche at the age of 15 years or more while the rest 32.7% of  
180 the respondents had their first menarche at less than 15 years of age. The mean of age at  
181 menarche was 16.35 years. One hundred forty three (33.9%) of the respondents reported that  
182 they had two or more lifetime sexual partners in their life time while the rest 279(66.1%) of the  
183 respondents had one lifetime sexual partner. Among the participants 310(73.5%) of the  
184 respondents had history of abortion. With regard to self-reported HIV status, 193(45.8%),  
185 139(32.9%) and 90(21.3%) of respondents were HIV positive, HIV negative and unknown status  
186 respectively. The majority of respondents, 389(92.2%) said that they had no history of HPV  
187 infection in their life time while 33(7.8%) of respondents had history of HPV infection at least  
188 once in their life time. The majority of study participants, 300(71.1%) had no history of STI  
189 while the rest 122(28.9%) acquired STI in their lifetime. Twenty nine (6.9%) of the respondents  
190 had history of smoking and the remaining 393(93.1%) had never smoke. More than half,  
191 310(73.5%) of the respondents had no history of abortion and only 112(26.5%) of them had  
192 history of abortion. The majority of respondents, 293(69.4%) had used oral contraceptives for  
193 five or more years. Among study subjects, 403(95.5%) of participants had no family history of  
194 cervical cancer and only 19(4.5%) had family history of cervical cancer. Three hundred three  
195 (71.8%) of study participants said that they had never used alcohol and the rest 119(28.2%) had

196 history of alcohol use. Concerning condom usage 178 (42.2%) of the respondents reported that  
 197 they never used condom in their life time while only 57(13.5%) of them used condom  
 198 consistently.

199 On bivariate analysis, having four or greater than four parity were significantly associated with  
 200 cervical precancerous lesion as compare with those who did not gave birth (crude OR= 2.29,  
 201 95% CI (1.34, 5.87). Having history of abortion were significantly associated with cervical  
 202 precancerous lesion as compare with those who did not have history of abortion (crude OR=1.62,  
 203 95% CI (0.98, 2.87). History of STI was significantly associated with cervical precancerous  
 204 lesion (crude OR=3.52 with 95%CI (1.71, 5.45). Those women with two or more life time sexual  
 205 partners were significantly associated with cervical precancerous lesion than those who have one  
 206 sexual partner (crude OR=3.56with 95% CI (2.25, 6.42). Positive HIV status were significantly  
 207 associated with cervical precancerous lesion (crude OR=1.80 with 95% CI (0.35-2.18). (Refer  
 208 table 2).

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

Variables	Number	Percent	COR(95% CI)	P-value
<b>Number of pregnancy</b>				<b>0.29</b>
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		
<b>Number of children born/parity</b>				<b>0.02*</b>
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		
<b>Age at first pregnancy</b>				<b>0.69</b>
< 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		
<b>Age at first intercourse</b>				<b>0.04*</b>
<20 years	123	29.1	2.19(1.51-3.89)	0.04
>=20 years	299	70.9	1.00	
Total	422			

<b>Age at first menarche</b>				<b>0.02*</b>
<15	138	32.7	1.00	
>=15	284	67.3	0.32(0.12-0.79)	0.03
Total	422			
<b>Number of sexual partners</b>				<b>0.00*</b>
1	279	66.1	1.00	
2 or more	143	33.9	3.56(2.25-6.42)	0.00*
Total	422	100		
<b>Self-Reported HIV Status</b>				<b>0.03*</b>
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		
<b>History of HPV infection</b>				<b>0.00*</b>
Yes	33	7.8	2.30(0.65-4.78)	0.00*
No	389	92.2	1.00	
Total	422	100		
<b>History of STI</b>				<b>0.04*</b>
Yes	122	28.9	3.52(1.71-5.45)	0.04*
No	300	71.1	1.00	
Total	422	100		
<b>History of smoking</b>				<b>0.03*</b>
Yes	29	6.9	1.80(0.68-3.91)	0.03*
No	393	93.1	1.00	
Total	422	100		
<b>History of abortion</b>				<b>0.02*</b>
Yes	112	26.5	1.62(0.98-2.87)	0.04*
No	310	73.5	1.00	
Total	422	100		
<b>History of prolonged oral contraceptive use</b>				<b>0.3</b>
<5 years	293	69.4	1.45(0.79-2.91)	<b>0.3</b>
≥5 years	129	30.6	1.00	
Total	422	100		
<b>Family history of cervical cancer</b>				<b>0.12</b>
Yes	19	4.5	1.72(0.66-3.89)	0.12
No	403	95.5	1.00	
Total	422	100		
<b>History of alcohol use</b>				<b>0.75</b>
Yes	119	28.2	1.5(0.86-2.91)	0.75
No	303	71.8	1.00	
Total	422	100		
<b>Condom use</b>				<b>0.04</b>
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		
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### 215 5.3. Prevalence of pre-cancerous lesions

216 From the total of 422 respondents, only 127(30.1%) of them were ever screened for cervical  
 217 cancer. From the total of respondents who had ever screened, 102(80.3%) of them had screened  
 218 once in their life time and only 25(19.7%) of study subjects screened more than once. Regarding  
 219 the time of screening, 117(92.1%) of respondents were screened within the last 5 years while  
 220 only 10(7.9%) of them were screened before five years. From those respondents who were ever  
 221 screened, only 11(8.7%) of study participants were VIA positive and the rest 116(91.3%) were  
 222 VIA negative. From those who were VIA positive, 7(63.6%) were treated with cryotherapy and  
 223 4(36.4%) were referred.

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

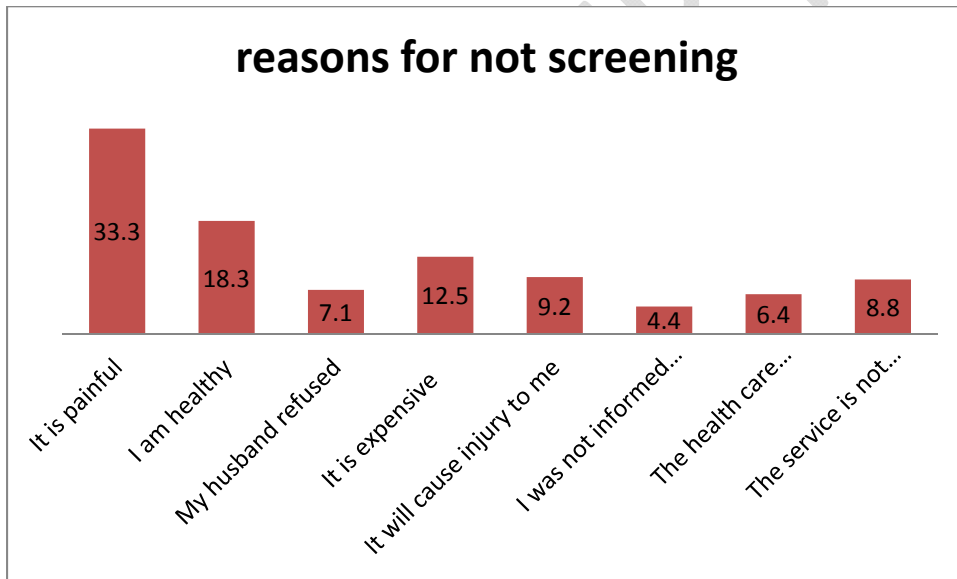
227 Among 422 study participants who were currently screened, 390(92.4%) were VIA negative,  
 228 29(6.9%) were VIA positive and 3(0.7%) were suspicious for cancer.

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

Variables	Number	Percent	COR(95% CI)	P-value
<b>Ever Screened for cancer of the cervix</b>				
Yes	127	30.1	1.33(0.65-2.89)	0.15
No	295	69.9	1.00	
Total	422	100		
<b>Screening frequency (for those who said yes)</b>				
Once	<b>102</b>	80.3	1.00	
More than once	<b>25</b>	19.7	0.55(0.24-1.95)	0.21
Total	<b>127</b>	100		
<b>Last time you screened (for those who ever screened)</b>				
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		
<b>VIA result at that time (for those who ever screened)</b>				
Positive	11	8.7	1.41(1.27-2.96)	0.99
Negative	116	91.3	1.0	
Total	127	100		
<b>Intervention provided(for positive results only, N=)</b>				
Treated with Cryotherapy	7	63.6	2.94(1.89-4.48)	0.77
Referred	4	36.4	1.00	

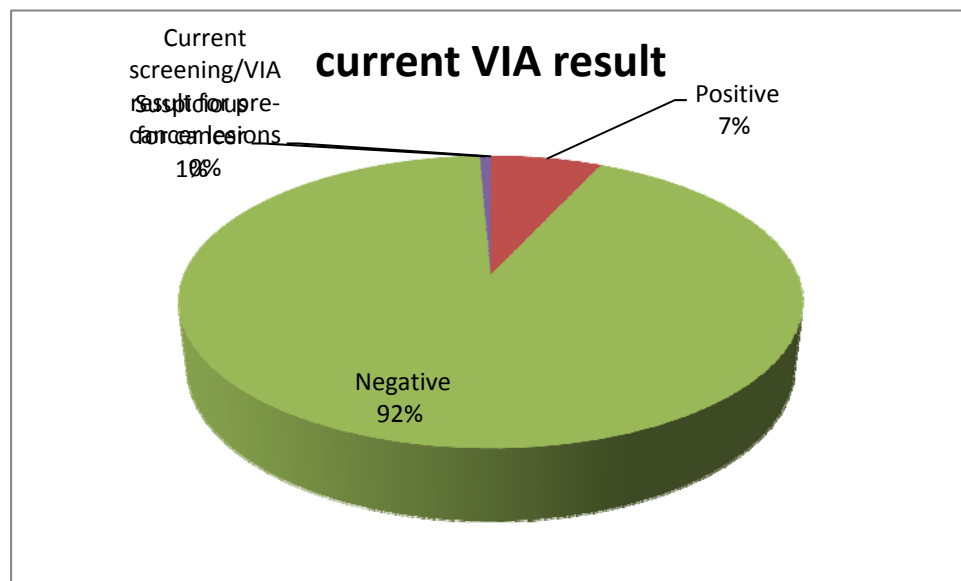
Total	11	100		
<b>Reasons for not screening(for those who did not ever screened)</b>				
It is painful	98	33.3	1.11(0.59-3.22)	0.19
I am healthy	54	18.3	1.85(0.98-3.77)	0.56
My husband refused	21	7.1	1.9(0.99-4.47)	0.97
It is expensive	37	12.5	0.65(0.23-3.39)	0.18
It will cause injury to me	27	9.2	1.57(0.75-3.92)	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			
<b>Current screening/VIA result for pre-cancer lesions</b>				
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		

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234 **Fig 1:- reasons for not screening**



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236 **Fig 2:- current VIA result of respondents**

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#### 241 **5.4. Factors associated with cervical precancerous lesion**

242 After bivariate analysis, variables with  $P \leq 0.20$  and other variables qualified as confounders for  
243 cervical cancer associated factors were included in multivariate logistic regression models to  
244 determine their association with invasive cervical cancer or precancerous lesions as dependent  
245 variables after elimination of variables with  $P > 0.05$  (multivariate analysis). Study participants  
246 who were in the age group of 46-50 years were two times more likely to develop cervical  
247 precancerous lesions than those in the age group of 30-35 years. (Adjusted OR=2.30, 95%CI  
248 (1.34- 4.50)).

249 Respondents who gave birth of four children or more were two times more likely to acquire  
250 precancerous cervical lesions than those who never gave birth. (Adjusted OR=2.16, 95%CI  
251 (1.36-5.89)).

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

256 Having two or more life time sexual partners was significantly associated with cervical  
 257 precancerous lesion (Adjusted OR= 3.86, 95%CI (2.37-6.69)). Respondents who were HIV  
 258 positive were 1.9 times more likely to develop precancerous cervical lesions. (Adjusted OR=  
 259 1.99, 95% CI (0.44-2.25)). Having history of HPV infection was significantly associated with  
 260 cervical precancerous lesions. (Adjusted OR= 2.5, 95% CI (0.75-4.95)). Women who had history  
 261 of sexual transmitted infection were three times more likely to have cervical precancerous lesion  
 262 than those who did not have history of sexually transmitted infections. (Adjusted OR=3.43,  
 263 95%CI (1.65-5.35)). Women who smoke cigarettes were two times more risk to develop cervical  
 264 precancerous lesions than those who did not smoke. (Adjusted OR=2.01, 95%CI (0.78-4.11)).  
 265 History of abortion was positively associated with developing cervical precancerous lesions.  
 266 (Adjusted OR=1.55, 95%CI (0.88-3.21)). Having family history of cervical cancer increases the  
 267 risk of developing cervical precancerous lesions by 1.85 times. (AOR=1.85, 95% CI (0.77-  
 268 3.99)). (Refer table 4)

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

Variables	Number	Percent	COR(95% CI)	AOR(95% CI)
<b>Age in years</b>				
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		
<b>Marital status</b>				
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		
<b>Educational status</b>				
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		
<b>Number of children born/parity</b>				
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		
<b>Age at first intercourse</b>				
<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			
<b>Age at first menarche</b>				
<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			
<b>Number of sexual partners</b>				
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		
<b>Self-Reported HIV Status</b>				
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		
<b>History of HPV infection</b>				
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		
<b>History of STI</b>				
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		
<b>History of smoking</b>				
Yes	29	6.9	1.80(0.68-3.91)	2.01(0.78-4.11)**
No	393	93.1	1.00	1.00
Total	422	100		
<b>History of abortion</b>				
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		
<b>Family history of cervical cancer</b>				
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		
<b>Condom use</b>				
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		

## 6. DISCUSSION

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

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

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

294 This study showed that there was no association between cervical screening and residence  
295 ( $p=0.26$ ). But a cross sectional study done in Uganda reported that Living in semi urban or urban  
296 areas was significantly associated with having undergone cervical cancer screening [COR = 2.54  
297 (95% CI: 1.37–4.71),  $p = 0.003$ ]. This difference might be due to socio-demographic differences  
298 in the two areas.

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

307 Study subjects who started sex before 20 years were 2.5 times more likely to have cervical  
308 precancerous lesions than those who started sexual intercourse at 20 or more years of age.  
309 (Adjusted OR=2.5, 95% CI (1.65-4.12)). The finding was in congruent with the study done in

310 United States and Venezuela which stated that beginning sexual intercourse at age 18 or younger  
311 accounted for a 3.9 times increased risk for cervical cancer and is a significant finding (  $p <$   
312  $0.01$ ). Another study done in Izmir also showed that starting to have intercourse in early ages is  
313 considered as a significant risk for cervical cancer and it is reported that cervical infections  
314 caused mostly by HPV develop with the first intercourse (Louie et al., 2009). Cross-sectional  
315 study in Jimma Ethiopia also supports this study which shows that initiation of sexual intercourse  
316 before the age of 16 years was a risk factor for developing cervical precancerous lesion.

317 The finding of this study showed that having two or more life time sexual partners was  
318 significantly associated with cervical precancerous lesion (Adjusted OR= 3.86, 95%CI (2.37-  
319 6.69)). Respondents who were HIV positive were 1.9 times more likely to develop precancerous  
320 cervical lesions. (Adjusted OR= 1.99, 95% CI (0.44-2.25)). This finding is in congruent with the  
321 study done in German 2015, which reported that sexually active adolescents may be at high risk  
322 of developing cervical dysplasia because of earlier initiation of sexual intercourse and having  
323 multiple sexual partners. The finding of this study was also similar with a case control study  
324 done in Zimbabwe which suggest that having more than one sexual partner, being HIV positive,  
325 early sexual debut ( $<15$ years), history of any form of STI and being single were significant risk  
326 factors for cervical precancerous lesion. Another study done in southwest Ethiopia showed that a  
327 wife with more than one husband and husband with more than one wife in lifetime was risk  
328 factor for invasive cervical cancer but history of STI and early age at first sex not significantly  
329 associated. A study done at Debre Markos Referral Hospital showed the prevalence of cervical  
330 pre-cancerous lesions was high (51.9 %) among HIV+ women than HIV negative women (AOR  
331 3.2, 95 % CI: (1.0 – 10,  $p = 0.048$ ))

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

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

346 This study showed that alcohol has no significant association with cervical lesion development.  
347 Similarly, a study done in Debre Markos showed that smoking and alcohol consumption were

348 not associated with the development of precancerous lesions. But other research works indicated  
349 that it has an indirect role (increase likelihood of multiple sexual partners). One study found that  
350 alcohol use, especially during the time of last sexual intercourse, was strongly associated with an  
351 increased likelihood of multiple sexual partners (Santelli, Robin, Brener, & Lowry, 2001).

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

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

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

367 The proportion of cervical precancerous lesions in this study was 6.9% and 0.7% were suspicious  
368 for cancer. In multivariate regression analysis increased age( $\geq 46$ ), high parity( $\geq 4$ ), first  
369 intercourse at  $< 20$  years, having  $\geq$  two sexual partners, positive HIV status, History of HPV  
370 infection, History of STI, Smoking, History of abortion, nonuse of condom and family history of  
371 cervical cancer were significantly associated with the development of cervical precancerous  
372 lesions. Similarly, a descriptive cross sectional and analytical study done in Rwanda showed that  
373 pre-cancer lesions (VIA positive) were most prevalent in participants who had first pregnancy  
374 before 20 years old, in participants who had first sexual intercourse before age 20, those who are  
375 HIV positive and those who had more than five sexual partner. Another study done among  
376 Hawassa university students also supported this study which showed that three main risk factors  
377 for development of cervical cancer were multiple sexual partners (85.5%), early sexual  
378 intercourse (80.1%) and HPV infection (69.1%).

379 The findings of this study showed no association between prolonged use of oral contraceptive  
380 pills and cervical lesions which is in-line with a case control study done in Nigeria which shows  
381 that there is no significant association between hormonal contraceptives use and abnormal  
382 cervical epithelial cytology. In contrary, this study was inconsistent with the study done in  
383 Uganda which reported that prolonged use of family planning pills and injections were  
384 significantly associated with development of cervical lesions. Another study conducted in Debre

385 Markos referral hospital also contradicts this study which said that OCP users for more than five  
386 years were found to be at higher risk of developing cervical cancer (AOR: 11.9, 95 % CI:  
387 2.1 – 16.7,  $p=0.02$ ). The inconsistency may occur due to difference in sample size and  
388 methodological difference.

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

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## 395 **7. CONCLUSION AND RECOMMENDATION**

### 396 **7.1 Conclusion**

397 This study tried to assess the proportions of cervical pre-cancerous lesions and associated factors  
398 in the study area. The proportion of cervical precancerous lesions in the study area was 6.9%. In  
399 multivariate regression analysis increased age( $\geq 46$ ), high parity( $\geq 4$ ), first intercourse at  $< 20$   
400 years, having  $\geq$  two sexual partners, positive HIV status, History of HPV infection, History of  
401 STI, Smoking, History of abortion, nonuse of condom and family history of cervical cancer were  
402 significantly associated with the development of cervical precancerous lesions. From the total  
403 422 study participants, only 127(30.1%) of them were ever screened for cervical cancer one or  
404 more times in their life time while the rest 295(69.9%) of the study subjects did not ever  
405 screened for cervical cancer in their life time. Concerning the reasons for not screening,  
406 98(33.3%) of them said that it is painful while 54(18.3%) and 37(12.5%) of them said I am  
407 health and it is expensive respectively. This indicates poor awareness on the importance of early  
408 screening and treatment of cervical pre-cancerous lesions.

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412 **7.2. Recommendations**

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

414 **Federal Ministry of health**

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

421 **Zonal Health office**

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

426 **Health professionals**

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

431 **Researchers:**

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

435

436

437 **LIST OF ACRONYMS and ABBREVIATIONS**

438

- 439 ➤ ACCP- Alliance for cervical cancer prevention
- 440 ➤ ACS- American cancer society
- 441 ➤ AIDS- Acquired Immunodeficiency Syndrome
- 442 ➤ CIN- Cervical Intraepithelial Neoplasia
- 443 ➤ CIS- Carcinoma In Situ
- 444 ➤ EDHS- Ethiopian demographic health survey
- 445 ➤ ESOG- Ethiopian of Obstetrics and Gynecology
- 446 ➤ FDA- Food and drug administration
- 447 ➤ FGAE-Family guidance association of Ethiopia
- 448 ➤ HIV- Human Immunodeficiency Virus
- 449 ➤ HPV- Human Papilloma Virus
- 450 ➤ HR-HPV-high risk Human Papilloma virus
- 451 ➤ LBC- Liquid Based Cytology
- 452 ➤ LEEP- Loop Electrosurgical Excision Procedure
- 453 ➤ LETZ- Loop Excision of the Transformation Zone
- 454 ➤ LGSILs- Low-Grade Squamous Intraepithelial Lesions
- 455 ➤ PPE- Personal Protective Equipment\
- 456 ➤ RHB- Regional Health Bureau
- 457 ➤ SCJ- Squamo-columnar Junction
- 458 ➤ SIL -Squamous intraepithelial lesions
- 459 ➤ STA- See and Treat Approach
- 460 ➤ STI- Sexually Transmitted Infection
- 461 ➤ SVA- Single visit approach
- 462 ➤ VIA- Visual Inspection with Acetic Acid
- 463 ➤ WHO- World Health Organization

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