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ORIGINAL ARTICLE

Assessing Factors that Influence Uptake of Cervical Cancer Screening in Family Guidance Association of Ethiopia, 2014

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Abstract

Background: Cancer of the cervix is the first most common cancer in Ethiopia and is a leading cause of death from cancer among women in low-resource settings, affecting women at a time of life when they are critical to social and economic stability. The development of a screening test for cervical dysplasia has been a major force in diminishing the worldwide incidence and mortality of invasive cervical cancer. The aim of this research is to establish facts that influence the uptake of cervical cancer screening in the target groups, in order to improve utilization of screening. Being deficient of preceding measurement confines the improvement and effectiveness of cervical cancer prevention efforts, primarily screening.

Methods: A quantitative, unmatched case control study was conducted. Women consisting of 122 cases and 488 controls were interviewed. Interviewer administered questionnaires was means of data collection by trained health professionals. Logistic regression and chi square tests were determined and significance of association was assessed using 95% CI and p-value < 0.05

Result: The study revealed that being in the age group of 38-49 (AOR:3.1, 95% CI:1.09,9.2) and previous screening increased the likelihood of screening (AOR:25, 95% CI 11.1, 55.9). Decreased likelihood of uptake of the test was observed among those who visited health facility for gynecologic reason last year (AOR:0.35 95% CI:0.19,0.66) and who achieved above the mean of the knowledge score (AOR:0.25 95% CI:0.13,0.45).

Conclusion: Comprehensive knowledge on important aspect about cervical cancer and screening is very low; misconception on symptoms, risk factors and indication on screening was found to be high.

Keywords

Pap smear, Cervical cancer, Cancer, Screening

Abbreviations

AOR: Adjusted Odd Ratio; CI: Confidence Interval; EDHS: Ethiopian Demographic Health Survey; HPV: Human Papilloma Virus; MOH: Ministry of Health; NGO: Non-Governmental Organization; SPSS: Statistical Package for Social Sciences

Introduction

In the last few years, non-communicable diseases including cancer have been received as public health issues. Recently, the government has recognized the growing burden of cancer. The federal MOH estimates there could be more than 150,000 cancer cases in Ethiopia each year, but available data is limited. Health experts explain that many Ethiopians with cancer never seek medical help. Those that do seek treatment may not be referred to the appropriate cancer center. The MOH recently created a task force to address non-communicable diseases, but government resources for cancer care are limited to treatment only [1]. Cervical cancer is the most common cancer in Ethiopia [2], the age adjusted incidence rate is high (i,e. 35.9 per 100,000 women) [3] and is a leading cause of death from cancer among women in low-resource settings, affecting women at a time of life when they are critical to social and economic stability. Despite the lack of a national cancer registry in Ethiopia, reports from a retrospective study of biopsy results have shown that it is the most prevalent cancer among women [4].

Risk factors that contribute to the development of cervical cancer precursors and cervical cancer

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include infection with certain oncogenic types of human papilloma virus (HPV), sexual intercourse at an early age, multiple sexual partners, multiparity, long term oral contraceptive use, tobacco smoking, low socioeconomic status, infection with Chlamydia tracomatis, micronutrient deficiency and a diet deficient in vegetables and fruits [5]. The development of a screening test for cervical dysplasia has been a major driving force in diminishing the worldwide incidence and mortality of invasive cervical cancer [6-8]. Due to the link of HPV and cervical cancer, there has been an increase in HPV screening and prevalence worldwide.

Since HPV has been identified as the cause of cervical cancer, HPV prevalence and screening uptake worldwide are now necessary to describe the epidemiology of this cancer [9]. It was also found that HIV increases the likelihood to develop cervical cancer [10].

The aim of this research is to establish factors that influence the increased use of cervical cancer screening in target groups in order to improve utilization of screening. Without knowledge of these factors, the improvement and effectiveness of cervical cancer prevention efforts, primarily screening are confined. Delivery of baseline information about the determinants of cervical cancer screening uptake among women in FGAE can assist program planners and health educators to target and modify the screening program.

Methods

Study setting

This study was conducted at an Addis Ababa model clinic at the Family Guidance Association of Ethiopia (FGAE). It is a non-profit, national Non-Governmental Organization created by a few volunteer Ethiopians in 1966. It is also the oldest and the largest organization with over 47 years of dedication in providing quality, broad ranging reproductive health services in Ethiopia complementing governmental efforts, including cervical cancer screening using a pap test for over a decade. There was an average of 20 clients per day who come for screening and more to use other reproductive and sexual health services.

Study design

Quantitative, facility based unmatched case control study was conducted from January to February 2014 to assess factors that influence uptake of cervical cancer screening.

Study population

The source population for this study was women in the reproductive age group of 15 and above that came for screening and who have access to the facility. Additional women utilized the facility seeking medical help other than screening during the study period. Cases were defined as study subjects who utilized the cervical cancer screening service and controls were defined as those who did not use the service.

Sample size

Unmatched case control study formula using Epi Info software was used to calculate the cases and controls needed for the study.100α% is the level of significance, for 5% alpha level; 95% confidence level and 80% power of the test are considered. Control to case ratio is 4:1 in order to increase the power of the study. Thus, 122 cases and 488 controls were needed (Table 1).

Sampling procedures

The study participants were selected using probability sampling method. According to a data gathered from FGAE, there is an average of 20 subjects daily who visit the facility to utilize the screening service. Alternatively, visitors may arrive to FGAE for other purposes like family planning, antenatal care, fertility clinic and integrated services. These departments receive 20 clients per day. The sample size required for the cases was 122 and the control group was 488. The study was planned to be done within a month based on the information noted above. As a result of two public holidays, the patient load was less than expected and it resulted in 8 additional days added to the interview schedule.

The study subjects were selected by systematic sampling method where 122 divided by 20 working days gives 6.1 subjects to be interviewed daily. To get the sampling interval, 20 subjects that came daily for screening (N) divided by 6 which is the needed subjects daily (n) gives approximately 3, so every 3rd client was interviewed i.e., k = 3. For the controls the procedure was the same, every 3rd client was interviewed from the four departments expressed above. Accordingly, 4*6 = 24 study participants were interviewed daily. Four controls were interviewed when a case is being interviewed.

Data collection procedures

Source of data was from interviewing volunteer study subjects using structured questionnaires. The questionnaire was first developed in English and then

Table 1: Explanation of the sample size calculation.

Factor	P_2	OR	P_1	Cases	Controls	Total
High Education	50%	3.6	78.3%	33	129	162
High SES	50%	2	66.7%	93	372	465
Knowledge of screening	67.3%	2	80.5%	122	488	610

translated to Amharic language and then translated again to English for consistency; then the Amharic version was used for the interview, the language which is widely used in Addis Ababa in which this study takes place.

Data was collected by five trained nurses (diploma and degree holders) who had experience in data collecting previously in similar studies. After obtaining verbal consent, the nurses collected data during normal working hours. The data collectors were trained for two days by the investigator in order to collect quality and comparative data. Additionally, the training gave details about their responsibility and the procedures to be followed including how to fill the questionnaire out during data collection. The objective of the study and the questionnaire was discussed in detail. The purpose of the training was to prepare the data collectors to make the highest possible care to record data carefully and completely and also to coach them on the ethical principles that should be followed and avoided during data collection.

A practice study was performed for two days using the prepared questionnaire before the actual data collection for both the cases and the controls was conducted. Using only 5% of the total sample size, the data collectors were able to practice on filling the questionnaire and identify unanticipated mistakes. Consequently, some minor errors on the questionnaire were detected such as missing letters while typing and skipped filters were identified and corrected.

Supervision was completed by the investigator every day to monitor the study closely and to check on each completed questionnaire. Feedback was also offered to the data collectors based on the findings every morning as well as regular checks to ensure completeness of the data collected.

Operational definitions

- Screening: The early detection of disease, precursors of disease, susceptibility to disease in individuals who do not show any signs of disease
- Case: Women aged 15- 49 who utilize the screening test.
- Control: Who do not utilize the screening test but come to the same facility for services other than screening.
- Knowledge: Awareness that cervical cancer is preventable, curable, detectable at its early stages, early detection predicts treatment outcome, have vaccination, its symptoms, risk factors; importance and indication for screening; those who have average and more than average knowledge on these are considered knowledgeable.

Variables

- **Dependent variable:** Uptake of cervical cancer screening
- **Independent variable:** Income, Educational status, Marital status, Visit to a health provider, Know anyone screened, Family history of cancer, Knowledge of screening

Inclusion and exclusion criteria

- **Inclusion:** Voluntary women aged 15- 49 who come to the facility
- **Exclusion:** Patients already diagnosed with cervical cancer, mentally and severely ill patients.

Data management and quality assurance

The questionnaire was numbered after it was filled in order to make it easy for inputting the data. After data had been collected, it was checked for completeness and accuracy everyday by the investigator and incomplete questionnaires were discarded. The questionnaires were stored in a sequence based on the numbers recorded and were kept in a secured location only accessible to the investigator. The data entry and cleaning was done using SPSS version 16 statistical package. Statistical analysis was also conducted using SPSS. Supervision was performed by the investigator during data collection to assure quality of data and for possible feedback.

Data analysis procedures

The chi square test was used to assess association between independent variables. Logistic regression tests were determined to estimate the risk of different factors on the dependent variable using the mentioned statistical program. The significance of association was assessed using OR, 95% confidence interval and p-value at < 0.05. The adjusted odds ratios with its 95% CI for associated factors are reported.

Knowledge concerning cervical cancer and its screening was assessed using ten questions to be scored out of ten, each question having a value of 1 and 0 point. Based on the response they gave, 1 was given for those who responded correctly and 0 for missing the answer. For the questions with possibility of multiple answers, listing at least one right answer was enough to achieve a point even it was mixed and listed with incorrect ones. The answers were added and calculated by percentage, which were afterwards used to calculate the mean score in order to classify the respondents into two categories; knowledgeable and not knowledgeable.

The questions intended to assess knowledge of cervical cancer and its screening was collected and scored by using the mean score. The mean was used as a cut-off point to decide whether the study subjects have knowledge or not. Accordingly, respondents

who scored average and above were considered as knowledgeable

Ethical consideration

This study does not involve any experiment on human subjects. Though, this study had obtained ethical clearance from Hawassa University Ethical Committee and FGAE's Chief executive officer before enrolling any of the study participants. The purpose and the benefit of the study were explained for each and every participant. If only informed verbal consent of the respondent had obtained, then interview was preceded. The right of the respondents to refuse to respond for few or all questions was respected and was explained for all the participants. The interview took place in a way that did not compromise their privacy and comfort; they were interviewed in the same room they were clerked and by the same health professional alone. There was high caution not to lead the clients to believe they could be treated differently based on their response. The study was only explained after they got the service to make sure that they were not influenced by the service provider. The confidentiality of information was assured by excluding the name and address of the respondent from the questionnaire and also by notifying and reassuring them that no unauthorized one have access to the response they gave.

Result

A total of 610 women subjects aged 18 to 49 were interviewed, out of which 122 were cases and 488 were controls.

Table 2 shows socio-demographic characteristics of Pap smear utilized among women of reproductive age. The mean age for the cases was 36 (±6.9) and 31 (±7.4) for the controls. When categorized into groups, age was statistically significant in the crude analysis.

Table 2: Socio-demographic characteristics of utilizers and non-utilizers of screening service at Family Guidance Association of Ethiopia, Addis Ababa, 2014.

Variables (n = 488)	cases (n = 122)	Controls (n = 488)	P-value
	Frequency (%)	Frequency (%)	
Age			**< 0.005**
18-27	12 (9.8)	154 (31.6)	
28-37	48 (39.3)	225 (46.1)	
38-49	62 (50.8)	109 (22.3)	
Educational status			**0.47**
Formal	115 (94.3)	448 (91.8)	
Non formal	7 (5.7)	40 (8.2)	
Financial status			**0.5**
Independent	83 (68)	314 (64.3)	
Dependent	39 (32)	174 (35.7)	
Monthly income			**0.3**
No income	39 (32)	174 (35.7)	
< 841	22 (18)	70 (14.3)	
842-2,000	38 (31)	129 (26.4)	
> 2,000	23 (18.9)	115 (23.6)	
Marital status			**0.04**
Ever married	109 (89.3)	395 (80.9)	
Unmarried	13 (10.7)	93 (19.1)	
Age at first sexual contact			**1.0**
≤ 25	103 (84.4)	403 (84.7)	
> 25	19 (15.6)	73 (15.3)	
Age of marriage			**0.1**
≤ 25	74 (67.9)	236 (59.7)	
> 25	35 (32.1)	159 (40.3)	
Currently pregnant			**< 0.005**
Yes	0 (0)	76 (16)	
No	122 (100)	400 (84)	
Parity			**< 0.005**
None	28 (23)	188 (38.5)	
One	17 (13.9)	93 (19.1)	
Two	40 (32.8)	118 (24.2)	
≥ Three	37 (30.3)	89 (18.2)	

Table 3: Screening practice and experience with cervical cancer among utilizers and non-utilizers of screening service at Family Guidance Association of Ethiopia, Addis Ababa, 2014.

Variables (n = 488)	Cases (n = 122)	Controls (n = 488)	P-value
	Frequency (%)	Frequency (%)	
Visited facility			**0.04**
Yes	30 (24.6)	169 (34.6)	
No	92 (75.4)	319 (65.4)	
Kind of facility			**< 0.005**
Governmental	11 (36.7)	43 (25.4)	
Private	16 (53.3)	53 (31.4)	
NGO	3 (10.0)	73 (43.2)	
Ever screened			**< 0.005**
Yes	97 (79.5)	138 (28.3)	
No	25 (20.5)	350 (71.7)	
Seen or heard woman affected			**0.5**
Yes	34 (27.9)	120 (24.6)	
No	88 (72.1)	368 (75.4)	
Family member affected			**0.2**
Yes	7 (5.7)	15 (3.1)	
No	115 (94.3)	473 (96.9)	

101 cases (82.8%) and 373 controls (76.4%) were married. Among the married subjects, 74 (69.9%) cases and 236 (59.7%) controls were married under 25 years of age. Of the cases, there were no pregnant subjects, however, for the controls, 76 (15.6%) subjects were pregnant at the time of data collection. Majority of the cases 94 (77%) had children when compared to the controls, 300 (61.5%). Of those, 40 (32.8%) cases and 118 (24.2%) controls had two children. Age of marriage and age at first sexual contact showed no difference between the two groups.

Regarding educational status, 94.3% of cases and 91.8% of the controls reported formal education. More than half of cases (68%) and controls (64.3%) were financially independent. There were 39 (32%) cases and 174 (35.7%) controls that had no personal income, while 38 (31.1%) cases and 129 (26.4%) controls earned between 842 to 2,000 birr per month. Based on educational status, financial status and monthly income in the two groups were not significantly different.

As shown in table three, subjects that had visited the health facility for gynecologic reasons in the last year were less in number when compared with the subjects that didn't visit. Among the kind of facilities visited, most of the cases 16 (53.3%) visited a private health facility, while most of the controls 73 (43.2%) visited nongovernmental institutions.

Large proportion of the cases (97, 79.5%) had screened for cervical cancer previously while only 138 (28.3%) of the controls had ever screened for cervical cancer. Among the screened subjects, majority responded the reason for screening was self-initiated between groups, 71 (58.2%) cases and 74 (53.6%) controls. Among the non-screened subjects, the most listed reason for not screening was related to knowledge barriers followed by psychosocial barriers. Among the controls, the reasons were mainly found to be no symptom 110 (31.4%), not being aware of pap test 97 (27.7%), and lack of interest 59 (16.9%). Among the cases (11, 44%), not being aware of the test was mentioned more often (Table 3).

An almost equal proportion of both groups had seen or heard woman affected by cervical cancer, which accounts for 34 (27.9%) of the cases and 120 (24.6%) of the controls. Of these, only a small proportion of the study subjects had a family member affected with cervical cancer; 7 (20.6%) of the cases and 15 (12.5%) of the controls.

In regard to study variables related to visiting the facility, kind of facility visited and previous screening, the results showed a significant difference across the two groups, however, there was no difference among those who had seen or heard of a woman with cervical cancer and had a family member affected.

Majority of the subjects had heard about the screening test (Table 3). When comparing the variables, 102 of the cases (83.6%), had heard of screening tests than the controls which were 360 (73.8%). Half of the cases 51 (50%) heard from media followed by family/ friend who accounts 30 (29.4%), but among the controls 144 (40%) mentioned health facility as source of information followed by media 134 (37.2%).

In regard to the question asking if participants knew anyone who had been screened for cervical cancer, nearly half of the cases knew someone (48%) and the

Table 4: Experience of screening tests among utilizers and non-utilizers of screening service at Family Guidance Association of Ethiopia, Addis Ababa, 2014.

Variables (n = 488)	Cases (n = 122)	Controls (n = 488)	P-value
	Frequency (%)	Frequency (%)	
Ever heard screening tests			**0.03**
Yes	102 (83.6)	360 (73.8)	
No	20 (16.4)	128 (26.2)	
Source of information			**< 0.005**
Media	51 (50.0)	134 (37.2)	
Family/friend	30 (29.4)	74 (20.6)	
Health facility	21 (20.6)	152 (42.2)	
Know anyone screened			**0.4**
Yes	49 (48.0)	158 (43.9)	
No	53 (52.0)	202 (56.1)	
Heard screening centers			**0.04**
Yes	32 (31.4)	155 (43.1)	
No	70 (68.6)	205 (56.9)	
Distance of the center			**0.2**
Near	11 (34.4)	62 (40)	
Not so near	3 (9.4)	28 (18.1)	
Far	18 (56.2)	65 (41.9)	

other half did not know someone (52%). However, more than half (56.1%) of the controls did not know anyone who had been screened for cervical cancer.

68.6% of cases and 56.9% of controls claimed they never heard of centers that do cervical screening tests before they came to the facility. Among those proportion of subjects who heard, 56.2% (18) of cases said the centers were far in distance for them, while among the controls, 40% (62) of the subjects responded that it was near in distance.

There was a statistically significant difference among groups who had heard of screening tests, centers and source of information but showed no difference in knowing anyone screened or distance of the centers for screening.

52.5% of cases and 51.2% of controls knew that cervical cancer is curable. In addition, 61.5% of cases and 69.1% of controls knew it was preventable. A high proportion of both cases 117 (95.9%) and controls 398 (81.6%) responded correctly that early detection of cervical cancer is good for treatment outcome, but only 47 (38.5%) of the cases answered correctly that cervical cancer is detectable at its early stages when compared to controls who responded correctly, 280 (57.4%) (Table 4).

118 (96.7%) and controls 398 (81.6%) did not know that cervical cancer has vaccination. 30 (24.6%) cases and 191(39.1%) controls answered that cervical cancer has symptoms but only 168 (34.4%) subjects among the controls listed the symptoms correctly when compared with the cases 28 (23%). Of the cases, 25.4% (31) and 34% (166) of controls think they know risk factors of cervical cancer, however, when asked to list risk factors, only 23 (18.9%) of the cases and 121 (24.8%) of the controls listed risk factors correctly.

97.5% of cases and 90% of controls think screening is important in the absence of symptoms. However, out of these subjects, only 20.5% of cases and 31.4 % controls correctly responded the age at which a woman should screen for the first time. None of the cases and only 12 (2.5%) of the controls replied correctly in regard to the frequency of screening. Misconceptions regarding the symptoms, risk factors, and duration for screening were observed among respondents when asked to list them.

(Insert Table 5 here)

Irritation, burning sensation and pain of external genitalia was mentioned repetitively (1.6% of cases and 3.2% of controls) but infection, back pain, ulcer and tumor on external genitalia were pointed out as major symptoms of cervical cancer. For risk factors such as lack of hygiene (3.3% of cases and 4.9% of controls) and abortion (1.6% of cases and 3.5% of controls), these were listed frequently but other answers were given by both groups including infection, ulcer, tumor, HIV, injectable contraceptives, using tampons, using rusted metals for cooking and sitting on hot stone.

Questions related to screening start date, showed that of those individuals who felt screening is important, 34 (27.9%) cases and 72 (14.8%) controls listed greater than 18 years of age as an answer. Only 7 (5.7%) cases and 26 (5.3%) controls listed greater than 15 years of age, whereas17 (13.9%) of cases and 21 (4.3%)

Table 5: Knowledge of respondents on cervical cancer screening among utilizers and non-utilizers of screening service at Family Guidance Association of Ethiopia, Addis Ababa, 2014.

Knowledge variables identified correctly (n = 488)	Cases (n = 122)	Controls (n = 488)
	Frequency (%)	Frequency (%)
Curable	64 (52.5)	250 (51.2)
Preventable	75 (61.5)	337 (69.1)
Detectable at its early stages	47 (38.5)	280 (57.4)
Early detection is good for treatment outcome	117 (95.9)	398 (81.6)
Have vaccine	4 (3.3)	47 (9.6)
List symptoms		
Vaginal bleeding	6 (4.9)	40 (8.2)
Pelvic/ lower abdominal pain	11 (9)	42 (8.6)
Vaginal discharge	18 (14.8)	126 (25.8)
List risk factors		
Multiple sexual partners	14 (11.5)	46 (9.4)
Sexual contact at an early age	3 (2.3)	18 (3.7)
Smoking	2 (1.6)	17 (3.5)
Repeated STI	10 (8.2)	48 (9.8)
Long term oral contraceptive use	0	3 (0.6)
Multiparity	0	23 (4.7)
Not eating balanced diet	1 (0.8)	6 (1.2)
Age for first time screening	25 (20.5)	153 (31.4)
Screening important in the absence of symptoms	119 (97.5)	439 (90.0)
How often should be screened	0 (0.0)	12 (2.5)
Mean score for knowledge (p<0.005)		
< 4.4	81 (66.4)	232 (47.5)
4.4+	41 (33.6)	256 (52.5)

of controls answered screening should occur after initiation of sexual activity. Additionally, study subjects considered marriage and having a baby as reasons to initiate screening.

Lack of knowledge among respondents was detected on the question referring to the frequency of screening test that should be attained regularly. 32.8% of cases and 22.3% of controls replied that a woman should be screened every 6 months, while 9% of both groups think it should take place every 3 months. The remaining subjects, 14.8% of cases and 7.6% controls, mentioned every month, two months, nine months, and every 5 years including not being sure on the recommended interval of screening.

The mean value computed to assess the respondent's knowledge was 4.4. 41 of the cases (33.6%) of the respondents scored on and above the mean when compared with the controls 234 (52%).

According to the result of this study, certain socio-demographic factors were found to be associated with an increase of screening for cervical cancer. Age groups were statistically significant between them after controlling for other factors. The odds of getting screened significantly increases with age, AOR = 3.1 CI 1.09, 9.2 ($p < 0.05$) among the age group of 38-49 when compared with those in the age group of 18-27.

As shown in Table 6, subject's marital status was found to be significantly associated with screening in crude analysis but not in adjusted analysis. The odds of getting screened were 1.9 times more among those who were ever married when compared with those who are single.

Socio-demographic factors such as educational status, employment status, financial situation, and monthly income were not associated with getting screened for cervical cancer. These 3 variables were also checked for collinearity and analyzed with logistic regression after being proven that they were not intercollerating.

Some reproductive and sexual variables like age at first sexual contact, being pregnant, having children, and number of children were analyzed for association. Having children was statistically associated with screening during the crude analysis and the odds of screening increased with parity but did not retain when adjusted for other factors.

Responses on experience with screening tests were also analyzed and among variables such as, previous visit to health facility for gynecologic reason in last

Table 6: Characteristics of respondents associated with uptake of screening for cervical cancer at Family Guidance Association of Ethiopia, Addis Ababa, 2014.

Variables	Cases (n = 122)	Controls (n = 488)	Crude OR (95%CI)	Adjusted OR (95%CI)
Age				
18-27	12	154	1	1
28-37	48	225	2.7 (1.4,5.3)	1.3 (0.4,3.6)
38-49	62	109	7.3 (3.7,14.1)	3.1 (1.09,9.2)*
Educational status				
Formal	115	448	1.4 (0.6,3.3)	***
Non formal	7	40	1	
Marital status				
Ever married	109	395	1.9 (1.06,3.6)	1.03 (0.32,3.2)
Unmarried	13	93	1	1
Parity				
None	28	188	1	1
One	17	93	1.2 (0.6,2.3)	0.5 (0.1,1.5)
Two	40	118	2.2 (1.3,3.8)	0.6 (0.2,1.5)
≥ Three	37	89	2.7 (1.6,4.8)	0.7 (0.3,1.8)
Visited facility				
Yes	30	169	0.6 (0.3,0.9)	0.35 (0.19,0.66)**
No	92	319	1	1
Ever screened				
Yes	97	138	9.8 (6.0,15.9)	25.0 (11.1,55.9)**
No	25	350	1	1
Family member affected				
Yes	7	15	1.9 (0.7,4.8)	***
No	115	473	1	
Heard centers for screening				
Yes	32	155	0.6 (0.3,0.9)	0.58 (0.31,1.06)
No	70	205	1	1
Source of information				
Media	51	134	1	1
Family/friend	30	74	1.06 (0.6,1.8)	0.91 (0.4,1.8)
Health facility	21	152	0.3 (0.2,0.6)	0.24 (0.1,0.4)**
Mean score for knowledge				
< 4.4	81	232	1	1
4.4+	41	256	0.4 (0.3,0.7)	0.25 (0.13,0.45)**

*P-value < 0.05; **p-value < 0.005; ***: Variables with p value of greater than 0.05 in crude analysis omitted from entering in to the multivariate model.

year, knowing of anyone screened, cost of screening, heard of screening centers, where did they hear of those centers, how far those centers were, knowledge of a woman with cervical cancer, and if a was family member affected. Among the variables analyzed those who had heard of centers for screening, those who said they visited a health facility, and who had past history of screening showed a significant difference between the other variables.

There was a statistically significant difference between those who visited the health facility and those who did not. The probability of being screened was less among those who visited health facility for gynecologic reason last year (65%). The likelihood of screening was found to be highly significant with previous history of screening (AOR = 25, 95%CI: 11.1, 55.9).

The mean score for knowledge was analyzed and the odds of screening was found to be decreased by 75%

($p < 0.005$) among those who are knowledgeable when compared with those who are not, after adjusting for other factors.

Discussion

The rate of cervical cancer screening is low in many developing countries including Ethiopia. Nowadays, a secondary prevention using a pap smear is the best alternative in order to mitigate cervical cancer morbidity and mortality worldwide. Efforts should be made to maximize the available screening services which are crucial to hasten the spread.

This study revealed that 50% of the subjects who screened for cervical cancer were in the age group of 38-49. It showed a positive correlation, however, the screening rate was lower in younger age groups. This correlation was also observed in other studies [11,12]. This could be due in part to the fact that younger age groups seek less medical help for preventive procedures because they feel they're an unlikely candidate for screening or it could be due to knowing that cervical cancer is low among their age groups. Another study done in Canada, states that older women had significantly higher odds of not getting screened when compared with younger ones despite the fact that cervical cancer mortality increases with age and its incidence is higher among women 40 years and older [13].

Many studies showed that educational background and socio-economic status have considerable influence on motivation for screening, although women with higher education may not necessarily seek screening [12,14] but showed no significant difference in this study.

History of a previous Pap smear test was found to be associated with subsequent practice in this study. The result was in line with a study done in China on Chinese women's motivation to receive future screening [15], another study also done in Kenya found out that there is significant association for screening in the future among those who have had previous history of screening [16].

Major barriers prevented them from screening like no symptoms, lack of awareness, and lack of interest in our study. Respondents who did not receive screening due to not having symptoms present, indicated they considered a pap smear test as a diagnostic tool for cervical cancer screening. This behavior was also seen in other studies [17]. Inadequate knowledge about the test was mentioned as a barrier in a study done in Botswana [18]. Even in communities with increased awareness of screening services (87% were aware) the test was avoided without a reason [19].

Visiting a health facility for gynecologic reasons during the previous year was found to be inversely related with screening. Those who visited health facilities were less likely to be screened than those who didn't. This finding did not correlate with other studies reviewed. A study done in Kuwait revealed those who visited gynecologist in the previous year had increased odds to screen when compared with those who visited before the previous two years [20].

In our study, many of the study subjects' had knowledge of the Pap smear test (83.6% of cases and 73.8% of controls). Regardless of their awareness, lesser part of them had practiced screening previously (79.5% cases and 28.3% controls). This finding is also reported in other similar studies confirming awareness only about the test is not a driving tool to practice it [20,21]. Another study done in Gondar, Ethiopia mentioned awareness and practice were both low (13.7% and 14.7% respectively) among the study subjects [3]. The difference in awareness could be mainly due to educational advancement of women observed in this study, according to the EDHS 2011 report. Women who attained more than secondary school was higher in Addis Ababa when compared in Amhara region (18.3% and 4% respectively). This could be explained by the wide exposure to media and health facilities in contrast to other regions in the country.

Media was mentioned by 40% as a source of information and this correlates with another study done in Ethiopia that found radio/ television (60.8%) was their major source of information [3]. Media is a powerful tool and can influence an individual's decision to be screened.

The health facility being a source of information regarding screening tests had an opposite effect on screening uptake when compared with media. This could have occurred due to believing it would be ordered by the health care giver if it was needed. Also, the majority of respondents visited NGOs and private facilities which raise the concern of cost versus no symptom.

Regarding knowledge on cervical cancer and its screening, nearly half of the respondents think it's curable (52.5% of cases and 51.2% of controls) and nearly two thirds think it's preventable (61.5% cases and 69.1% controls) which is also observed in other studies [3]. Despite a high proportion of study subjects (95.9% cases and 81.6% controls) believing that early detection predicts treatment outcome, knowledge on early detection was observed to be low (38.5% cases and 57.4% controls).

Studies showed that HPV vaccination offers protection against the development of cervical cancer and associated morbidities and mortalities where secondary prevention methods such as cytology screening are not widely available. Majority of respondents were unaware that HPV vaccine could protect cervical cancer in this study, which is a similar finding in Ghana [22].

Knowledge on symptoms and risk factors were generally low. However, there was a difference between cases and controls where controls were shown to have

more knowledge. 34% and 24.8% of controls when compared with cases (23% and 18.9%) listed symptoms and risk factors correctly, respectively. The decreased level of knowledge on risk factors was also seen in a study conducted in Uganda (29%), even though there was higher rate of knowledge that it is curable (81%) and detectable (83%) when compared to our study [21]. The reason for such variation might be explained by the fact that the study was done in a teaching hospital that involved medical staff and students. However, misconception on both symptoms and risk factors were encountered which is comparative to another qualitative study conducted in Ethiopia [23] which showed that perceiving cervical cancer as not a risk in their life could prevent them from seeking screening services.

Nearly all (97.5%) of those who screened for cervical cancer in this study and their counterparts (90%) believed in screening despite the absence of symptoms, however, there was decreased knowledge on the recommended age and interval for screening. This finding was repeated in other study [17]. Contrary to many studies that suggest increasing knowledge increases participation [12]; our study found that individuals with more than average knowledge were less likely to be screened. It is becoming increasingly clear that the provision of information is actually not neutral, that individuals appear to respond differently to the manner in which the information is conveyed to them [24]. Also, the difference could be explained by the fact that a majority of our controls were in the younger age group who are likely to feel less vulnerable to cervical cancer. The study conducted in Nigeria also showed that increased knowledge on the topic had not resulted in increased screening [19].

Declarations

Ethics approval and consent to participate

This study does not involve any experiment on human subjects. Though, this study had obtained ethical clearance from Hawassa University Ethical Committee and FGAE's Chief executive officer before enrolling any of the study participants. The purpose and the benefit of the study were explained for each and every participant. If only informed verbal consent of the respondent had obtained, then interview was preceded. The right of the respondents to refuse to respond for few or all questions was respected and was explained for all the participants. The interview took place in a way that did not compromise their privacy and comfort; they were interviewed in the same room they were clerked and by the same health professional alone. There was high caution not to lead the clients that they could be treated differently based on their response. The study was only explained after they got the service to make sure that they were not influenced by the service provider. The confidentiality of information was assured by excluding the name and address of the respondent from the questionnaire and also by notifying and reassuring them that no unauthorized one have access to the response they gave.

Conclusion

Our study done on women of the reproductive age groups in Family Guidance Association of Ethiopia, revealed that educational background, marital status, family history of cervical cancer and awareness on centers that give screening is not associated with uptake of screening.

The most important factor that highly increased the uptake of screening was history of previous screening with the media being the source of information.

Comprehensive knowledge on important aspect about cervical cancer and screening is very low; misconception on symptoms, risk factors and indication on screening was noticed.

Visiting health facility for gynecologic reason and having more than average knowledge was found to decrease the likelihood of screening.

Recommendation

Irrespective of individual and neighborhood factors, the government's investment in the health infrastructure has the potential for significantly improving cancer screening rates within a country [14]. Efforts should be made to increase health expenditure which could in turn result in improved outcome.

Since previous screening has highly increased subsequent practice, the government should consider initiating mass screening.

Misconception and disbeliefs should be addressed using media as a primary way of transferring information. There is a need for information on the indication on screening, risk factors and symptoms of cervical cancer, such information could increase attendance of screening. Women's perceived susceptibility that blocked them from screening should be dealt with informing their susceptibility despite symptoms. This will help prevent themselves from the disease and change their idea of screening as a diagnostic tool for cervical cancer.

Until organized and routine screening is achieved, the use of opportunistic screening should be taken as an option to increase the uptake of screening.

Consent for publication

Not Applicable.

Availability of data and material

The data sets used and analyzed during the current study are available from the corresponding author on reasonable request. However, we stated to the participants of the study not to disclose the information they shared on the consent form.

Competing interests

There was no competing interest.

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There is no conflict of interest between authors.

Author contribution

FYB: conceive the study, contributed to study design, data collection, data analysis, data interpretation and writing of the manuscript and reviewing the manuscript; YGS: contributed to data collection, data clearance, data interpretation, writing and critically reviewing of the manuscript.

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