

CERVICAL CANCER SCREENING UPTAKE AND ITS ASSOCIATED FACTORS AMONG REPRODUCTIVE AGE WOMEN IN JIMMA TOWN: A COMMUNITY BASED CROSS-SECTIONAL STUDY

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ABSTRACT

OBJECTIVE: This study assessed cervical cancer screening uptake and its associated factors among reproductive-age women in Jimma town.

METHODS: A community-based cross-sectional study was conducted in Jimma town among randomly selected 905 reproductive-age women. Data were collected using face-to-face interviews using a structured questionnaire. Descriptive summaries of data were done using descriptive statistics. Binary logistic regression was used for the analytical study. Adjusted odds ratio and 95% confidence interval were respectively used to measure statistical associations and their statistical significance.

RESULTS: From total of 905 women participated 83 (9.2%) women had ever been tested for cervical cancer. Being head of household (OR= 2.19, 95%CI; 1.38, 3.47), making decision autonomously (OR = 2.31, 95%CI;1.24, 4.30), good knowledge of cervical cancer (OR= 4.12, 95%CI; 2.41, 7.03), favorite attitude towards cervical cancer screening (OR= 6.10, 95%CI; 3.05, 12.18), and awareness on HIV self-status (OR = 3.57, 95%CI;1.57, 8.14) were factors positively associated with uptake of the screening. But, lack of accessibility to media like radio, television and etc. and lack of formal education were negatively associated with uptake of cervical cancer screening.

CONCLUSION: The rate of cervical cancer screening uptake from the current study is low. Streamlining and strengthening curriculum integration and extracurricular health education intervention on cervical cancer giving due emphasis using media like radio, television, mobile applications are recommended and increasing coverage of health education to promote cervical cancer screening.

KEY WORDS: Cervical cancer, screening, uptake, women, Ethiopia

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INTRODUCTION

Cervical cancer is a preventable and curable disease as long as it is detected early and managed effectively, however, it is yet the fourth most common cancer among women globally, with an estimated 604,000 new cases and 342,000 deaths in 2020¹⁻⁴.

The annual number of new cases of cervical cancer has been projected to increase from 570 000 to 700 000 between 2018 and 2030, with the annual number of deaths projected to increase from 311 000 to 400 000³. In the year 2020, globally, about 90% of the new cases of cervical cancer and deaths occurred in low- and middle-income countries^{1,4,5}. The systematic review and meta-analysis done in Ethiopia showed that the pooled prevalence of cervical cancer among women in Ethiopia is 13.4%⁶. The other cross-sectional study which was done among women who attended cervical cancer screening at Ghandhi Memorial Hospital, Ethiopia showed that 23.5% of the screened women were found positive for VIA test⁷. Despite these impacts, cervical cancer screening rates remain low, particularly in sub-Saharan Africa. In Ethiopia, the 2020 HSTP-I report indicated a screening rate of just 5%, with other studies showing a range from 2.5% to 38.7%⁸. “Screen-and-test” approach is an alternative method to swiftly decide on cervical cancer treatment instead of using the standard sequence of cytology, colposcopy, biopsy, and histological confirmation of CIN. The available screening tests include a human papillomavirus (HPV) test, visual inspection with acetic acid (VIA), and cytology (Pap test)^{1,5,8}. Two human papillomavirus (HPV) types (16 and 18) are responsible for nearly 50% of high-grade cervical pre-cancers. HPV is mainly transmitted through sexual contact and most people are infected with HPV shortly after the onset of sexual activity. Vaccination against HPV and screening and treatment of pre-cancer lesions is a cost-effective way to prevent cervical cancer^{1,5}. Even though cervical cancer screening test is an available alternative method to initiate early prevention and control of the disease, as to the best knowledge of the investigators, the proportion

of reproductive-age women utilizing the screening service and its associated factors are not well studied among reproductive-age women in Jimma town and there is a dearth of information at the national level. Therefore, the current study is aimed to investigate the cervical cancer screening uptake and its associated factors among reproductive-age women in Jimma town.

Methods

Study setting and period

The study was conducted in Jimma town from January 01-30, 2021. Jimma town is found in the Southwest of Ethiopia at 354 km from Addis Ababa, the Capital city of the country. According to the information from the population projection of the 2007 Population and Housing Census of Ethiopia, the town has 50286 households and a total population of 241, 372, of which 121, 362 are females⁹. There are 53,416 reproductive-age women in the town. According to the information from the town health office, Jimma town has 14 government health facilities: 2 hospitals, 4 health centers, and 8 health posts. The town has also 3 private hospitals and 37 private medium clinics. Currently, cervical cancer screening is being given at two governmental hospitals, four governmental health centers, three private hospitals, and four private medium clinics in the town.

Methodology

Study design and population

A community-based cross-sectional study was conducted among randomly selected reproductive-age women living in Jimma town.

Sample size determination and sampling techniques

The sample size was calculated using a single population proportion following assumptions: 95% two-sided confidence interval, 38.1% proportion of cervical cancer screening uptake among reproductive-age women from the study done in the Northern Ethiopia¹⁰, 4% margin of error, and a 10% non-response rate.

$$n = \frac{(Z_{\alpha/2})^2 pq}{d^2} * DEFF \quad n = \frac{(1.96_{\alpha/2})^2 (0.381 * 0.619)}{(0.04)^2} * 1.5 \sim 850$$

Then, by adding a 10% non-response rate, the final sample size will be 935 reproductive-age women.

Four Gendas (the lowest administrative unit) were randomly selected from the thirteen Gendas (kebele) in the Jimma town by proportionally allocating among selected Gendas based on the number of households. Systematic random sampling was used to select households from each Genda. The lottery method was used to select a single reproductive-age woman where there are two or more than two reproductive-age women in a single household.

Eligibility criteria

Inclusion criteria

- All women above 30-49 years old
- Women who had lived at least 6 months in the town

Exclusion criteria

- Women who couldn't give written consent having severe illness

Data collection procedure (Instrument, personnel, data collection technique)

Data were collected using a structured interviewer-administered questionnaire that was adopted from similar literature^{10,12-16}. The questionnaire has three major parts which comprise socio-demographic related, individual and behavioral related, and medical and obstetric related questions. Eight diploma nurses collected the data and two BSc nurses supervised the overall data collection process.

Operational Definition

Knowledge about cervical cancer and screening:

15 knowledge questions were used and correct answers were categorized as 1 while incorrect answers were categorized as 0. The total point scored was 15 and the minimum was 0. Then, the scores with their respective knowledge levels were 12-15 good knowledge, 8-11 satisfactory knowledge, 0-7 poor knowledge

Attitude towards cervical cancer and screening:

we assessed the attitude using a Likert scale. The scoring system used was: strongly disagree =1, disagree=2, indifferent=3, agree= 4, strongly agree=5. The responses were summed and a total score was obtained. Then we calculated the mean score. Those who scored the mean score and above were considered as having a favorite attitude, whereas those the women who scored below the mean score were categorized as unfavorable attitudes towards cervical cancer screening

Data quality control measures

The data collection tools were translated to the local languages (Afan Oromo and Amharic) to ensure the full comprehension of the questionnaire by the study participants. Data collection tools were pre-tested on 47 (5% of the total sample size) reproductive-age women in Agaro town which is located 45 km away from Jimma town in the Southwest. The data collection tools were modified based on the pre-testing results. A two-day intensive training was given to the data collectors and supervisors on the aim of the study, data collection tools, and ethical issues. The supervisors checked for data completeness and consistency daily on data collection dates.

Data processing and analysis plan

The collected data were checked for completeness and consistency, and coded manually. Data were entered using Epi-data manager software version 4.1, and exported to the SPSS Software version 26 for data processing and analyses. Descriptive studies were done to summarize descriptive data. Binary logistic regression was used to assess statistical associations between the dependent and independent variables. During the bivariate analysis, variables with a p-value <0.25 were considered as candidate variables for the multivariable logistic regression. Multicollinearity between the independent variables was tested using variable inflation factor (VIF) before fitting the final model. Multivariable logistic regression was fitted to identify independent predictors of cervical cancer

screening uptake and to control for confounders. Adjusted odds ratio and 95% CI were respectively calculated to assess statistical associations and their statistical significance in the final model.

Results

Socio-demographic Characteristics

Nine hundred five (905) reproductive-age women participated in the study making the response rate 96.79%. The mean age of the study participants was 33.59 years with a standard deviation of + 7.08 years.

More than one-fifth (22.4%) of the participants are in the age group of 30-34 years. The majority, 382(42.2%) of the study participants are Orthodox Christianity followers followed by Muslim, 295 (32.6%). Nearly one in ten, 95 (10.5%) women have no formal education, and nearly one-third, 305 (33.7%) of the women are housewives (Table 1)

Table 1: Socio-demographic Characteristics of reproductive-age women in Jimma town

Variable	Categories	Frequency	Percentage
Age	<24	193	21.3
	30-34	203	22.4
	25-29	103	11.4
	35-39	189	20.9
	40-44	131	14.5
	45-49	86	9.5
	Total	905	100.0
Religion	Orthodox	382	42.2
	Protestant	198	21.9
	Catholic	30	3.3
	Muslim	295	32.6
	Total	905	100.0
Marital status	single	71	7.8
	married	700	77.3
	divorced	56	6.2
	widow	54	6.0
	separated	24	2.7
	Total	905	100.0
Educational status	Can't read and write	95	10.5
	primary	235	26.0
	secondary	229	25.3
	technical/vocational	191	21.1
	higher	155	17.1
	Total	905	100.0
Occupation	Government employee	254	28.1
	Farmer	14	1.5
	Non-government employee	80	8.8
	Merchant	110	12.2
	House wife	305	33.7
	Daily Laborers	142	15.7
	Total	905	100.0

Cervical Cancer Screening Uptake

Of the total 905 (100%) women who participated in the study, 83 (9.2%) had ever been screened for cervical cancer. Among women ever screened for cervical cancer, 56 (67.5%) were screened five years before the research done, and 1(1.2%) was screened positive for cervical lesion (Table 2

Table 2: Cervical Cancer Screening Uptake among Reproductive-age women in Jimma Town

Variable	Categories	Frequency	Percentage
Ever been screened for cervical cancer	Yes	83	9.2
	No	822	90.8
	Total	905	100.0
The last time screened for cervical cancer	Within the past 3 years	27	32.5
	More than 5 years ago	56	67.5
	Total	83	100.0
Test result of the screening among screened	Positive	1	1.2
	Negative	82	98.8
	Total	83	100.0

Factors associated with cervical cancer screening uptake

There are several factors identified having statistically significant association in increasing the uptake of cervical screening at Jimma city. The odds of cervical cancer screening uptake was high among woman who are employed, the head of household, making decisions autonomy, using social media, having good knowledge and attitude towards screening, know their HIV status, and dwelling near health institution (Table 3).

Table 3: Factors associated with cervical cancer screening among reproductive-age women

Variable	Categories	Cervical Cancer Screening Uptake		AOR (95 % CI)	P Value
		Yes (%)	No (%)		
Educational status	Uneducated	3 (3.2%)	92 (96.8%)	0.20 (0.06,0.64)	0.005*
	Primary	24 (10.2%)	211 (89.8%)	0.69 (0.37,1.27)	0.23
	Secondary	17 (7.4%)	212 (92.6%)	0.49 (0.25,0.94)	0.03*
	Technical	17 (8.9%)	174 (91.1%)	0.59 (0.30,1.15)	0.12
	Higher	22 (14.2%)	133 (85.8%)	1	
Occupation	Government employee	28 (11.0%)	226 (89.0%)	4.27(1.53, 11.91)	0.004*
	Nongovernment employee	15 (16%)	79 (84%)	6.55 (2.30, 19.42)	0.0003*
	Merchant	16 (14.5%)	94 (85.5%)	5.87 (1.99, 17.24)	0.001*
	House wife	20 (6.6%)	285 (93.4%)	2.42 (.85, 6.89)	0.10
	Daily L	4 (2.8%)	138 (97.2%)	1	
Head of Household	Yes	34 (14.7%)	198 (85.3%)	2.19 (1.38, 3.47)	0.001*
	No	49 (7.3%)	624 (92.7%)	1	
Family size	<5	27 (7.2%)	347 (92.8%)	0.66 (.41, 1.06)	0.09
	>=5	56 (10.5%)	475 (89.5%)	1	
Woman decision making autonomy	Yes	71 (10.7%)	591 (89.3%)	2.31 (1.24, 4.30)	0.008*
	No	12 (4.9%)	231 (95.1%)	1	
Reading newspaper	More than 1/week	54 (15.2%)	302 (84.8%)	4.30 (2.51, 7.36)	0.000*
	Once a week	10 (13.7%)	63 (86.3%)	3.82 (1.73, 8.45)	0.001*
	not at all	19 (4.0%)	457 (96.0%)	1	
Listening to radio	More than 1/week	65 (13.9%)	403 (86.1%)	5.52 (2.74, 11.10)	0.000*
	Once a week	9 (7.5%)	111 (92.5%)	2.77 (1.11, 6.97)	0.03*
	Not at all	9 (2.8%)	308 (97.2%)	1	
Watching television	More than 1/week	79 (10.2%)	694 (89.8%)	3.60 (1.18, 10.10)	0.02*
	Once a week	1 (2.9%)	33 (97.1%)	0.96 (0.0, 7.02)	0.97
	Not at all	3 (3.1%)	95 (96.9%)	1	
Owning mobile	Yes	81(10.2%)	712 (89.8%)	6.26 (1.67,)	0.004*
	No	2 (1.8%)	110 (98.2%)	1	
Using internet	Yes	56 (12.5%)	393 (87.5%)	2.26 (1.41, 3.64)	0.001*
	No	27 (5.9%)	429 (94.1%)	1	
Distance from health facility	<30 minutes	46 (12.7%)	315 (87.3%)	2.00 (1.27, 3.15)	0.002*
	>= 30 minutes	37 (6.8%)	507 (93.2%)	1	
Knowledge of cervical cancer	Good knowledge	65 (14.5%)	384 (85.5%)	4.12 (2.41, 7.03)	0.000*
	Poor knowledge	18 (3.9%)	438 (96.1%)	1	
Attitude towards cervical cancer	Favorite attitude	74 (13.6%)	472 (86.4%)	6.10 (3.05, 12.18)	0.000*
	Unfavorite attitude	9 (2.5%)	350 (97.5%)	1	
Family History of Cervical Cancer	Yes	8 (11.8%)	60 (88.2%)	1.35 (0.63, 2.90)	0.44
	No	75 (9.0%)	762 (91.0%)	1	
Awareness on HIV self-status	No	6 (3.2%)	179 (96.8%)	1	
	Yes	77 (10.7%)	643(89.3%)	3.57 (1.57, 8.14)	0.002*

DISCUSSION

The current study revealed that out of the total 905 reproductive-age women who participated in the study 9.2% women had ever been screened for cervical cancer. This result is consistent with the finding from the study done in the Western Oromia region, Ethiopia (8.7%)¹³. The magnitude of cervical cancer screening uptake among reproductive-age women from the current study is far below the findings from similar studies done in Jordan (31.2%)¹⁷, Ghana (24.6%)¹⁸, Mekelle (19.8%) and Adigrat town (38.1%) of Tigray region, Ethiopia^{10,14}, Sidama Zone, Southern Ethiopia (17.8%)¹⁹, and North Shoa, Ethiopia (21.2%)²⁰. However, the result is higher than the findings from the studies done in Uganda (4.8%)²¹, Tanzania (7.9%)²², and Southwestern Ethiopia (7.3%)²³. The discrepancies might be due to differences in access to maternal health care services in the different geographical locations. Studies have shown that there are inter-countries variations and inequalities in access and utilization of maternal, newborn, and child health services in sub-Saharan Africa and need context-specific intervention programs^{24,25}. Besides, the study done in Ethiopia also portrayed that there is huge disparities in utilizing maternal health care services in Ethiopia and more attention is needed for Afar, Somali, and Oromia regions to sustain the progress equally²⁶.

The current study also depicted that different factors are significantly associated with the uptake of cervical cancer screening. The odds of cervical cancer screening uptake among are different in this study done on reproductive-age women even though there is no proven causative relationship. This finding is supported by different studies. The study done in Kenya using the secondary data analysis of the 2014 Kenya demographic and health survey (2014 KDHS) showed that Christian women had higher odds of being screened than Muslim women²⁷. The study done in Chicago also showed that American Muslim women had lower odds of cervical cancer screening uptake due

to their beliefs that diseases are manifestations of punishments from God²⁸. Similarly, the study done in Southern Ghana²⁹ and Canada¹⁵ showed that Islamic modesty and commitment to the Islamic faith, and being born in a Muslim majority community are associated with decreased odds of cervical cancer screening uptake. This might be due to differences in religion-related dogma and needs further qualitative exploration.

The current study also evidenced that being a head of a household was positively associated with the uptake of cervical cancer screening: a woman who is a head of a household was 2 times high likely to uptake cervical cancer screening as compared to a woman who is not a head of a household. The possible explanation for this can be the lack of autonomy or the diminished autonomy of the women who are not the head of a household to decide on their maternal healthcare services utilization. The study done using Secondary data from the Demographic and Health Surveys of six Sub-Saharan African countries showed that the odds of cervical cancer screening uptake was highest among women who made healthcare decision alone³¹. Similarly, many other studies have witnessed that women who have decision-making autonomy had higher odds of maternal healthcare services utilization³²⁻³⁵.

A woman's knowledge of cervical cancer was also significantly associated to cervical cancer screening uptake having odds of 4 times than a woman who has poor knowledge of cervical cancer. This result is concordant with the findings from many other similar studies. The studies from Ghana^{18,29}, Tanzania²², Nigeria³⁶, and Loa People's Democratic Republic³⁷ depicted that having knowledge of cervical cancer is significantly associated with increased odds of cervical cancer screening uptake. The different studies done in Ethiopia also showed that women who have higher knowledge of cervical cancer had higher odds of cervical cancer screening uptake as compared to the women who had poor knowledge of cervical cancer^{10,14,20,38-44}.

The present study also evidenced that attitude towards cervical cancer screening was significantly

associated with the uptake of the screening: a woman who has a favorable attitude towards cervical cancer screening 6 times odds likely to uptake the service as compared to a woman who does have a unfavorable attitude. This finding is consistent with the findings from the studies done in Southern Ghana²⁹, North Central Nigeria⁴⁵, Loa People's Democratic Republic³⁷, and Dhaka, Bangladesh⁴⁶. Similarly, the systematic review and meta-analysis done in Ethiopia showed that a woman who has a favorable attitude toward cervical cancer screening was 6.1 times more likely to accept cervical cancer screening as compared to a woman who has an unfavorable attitude towards cervical cancer screening³⁸. The other systematic review and meta-analysis done in Ethiopia using 14,582 age-illegible women from 24 different studies showed that women with favorable attitudes towards cervical cancer screening have higher odds of cervical cancer screening uptake as compared to women who have unfavorable attitudes towards cervical cancer screening⁴³.

A woman who does listen to a radio more than one per week was 5.5 times odds of high likely to uptake cervical cancer screening service as compared to a woman who doesn't listens to a radio at least once a week. This finding is supported by results from similar studies. The study done using secondary data analyses from the Demographic and Health Surveys of six Sub-Saharan African countries showed that women who listened to a radio at least once a week had significantly higher odds of cervical cancer screening uptake as compared to women who had not listened to a radio³¹. Similarly, the randomized controlled trial done among 658 randomly selected study participants in Cape Town, South Africa to evaluate the effect of media intervention on increasing cervical cancer screening uptake showed that the women who had recalled hearing the radio-drama were more likely to attend cervical cancer screening as compared to those who had not recalled hearing the radio-drama⁴⁷. This might be due to the reasons that exposure to the mass media increases the knowledge of cervical cancer which in turn increases the likelihood of accepting cervical

cancer screening. The sequential explanatory mixed methods approach consisting of an analytical cross-sectional survey and qualitative inquiry done in Harare, Zimbabwe depicted that the women who had listened to the radio had higher odds of cervical cancer knowledge as compared to the women who had not listened to the radio⁴⁸.

The odds of cervical cancer screening uptake among the women who had not ever used contraceptives was not significantly different the women who had ever used contraceptives. This result is contrary to the finding from a similar study done in Ambo Town, Central Ethiopia⁴⁴. The discrepancy could be due to the differences in age among the two populations. The current study included all randomly selected reproductive-age women in the study while the study done in Ambo Town, Central Ethiopia included only women aged between 30-49 years. The study done in Ambo Town, Central Ethiopia⁴⁴, and many other studies^{13,14,19,40,43} showed that older age was associated with increased odds of knowledge of cervical cancer among the women included in the studies.

Conclusions

The rate of cervical cancer screening uptake from the current study is critically low. Factors like being a household head, having good knowledge of cervical cancer, having favorable attitude towards cervical cancer, and using different social media were positively associated with cervical cancer screening uptake. The Ethiopian Federal Ministry of Health, the Jimma Zonal Health Department, the Jimma Town Health Office, and other stakeholders should consider streamlining and strengthening curriculum integration and extracurricular health education intervention on cervical cancer. Due emphasis should also be given to mass-media expansions and increasing coverage of health education to promote cervical cancer screening.

Author Contributions

All authors conceived and designed the study. F.A.D performed the data analysis, and A.T.K.,

M.N.G. and D.T.D. helped interpret the results. F.A.D and D.T.D. drafted the manuscript, and all authors revised it critically for important intellectual content. All authors approved the version to be published.

Ethics Statement

The Jimma University Institute of Health Institutional Review Board (JUIHIRB) approved the study, the informed consent, and the approach for obtaining informed consent from subjects. The approval was given on date 08/12/2020 with ref. no IHRPGY/1028/20. All women provided verbal or written informed consent, depending on their level of literacy. A local community health representative independent from the study ascertained that all instances of verbal consent were given after subjects listened attentively to the full text of the consent form read by the study staff.

Conflicts of Interest

The authors declare no conflicts of interest.

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