

## Intention to screen for cervical cancer and factors associated among female healthcare professionals using the trans-theoretical model: Addis Ababa, Ethiopia

Semarya Berhe<sup>1\*</sup>, Rebecca A Gary<sup>2</sup>, Katherine A Yeager<sup>2</sup>, Melinda K Higgins<sup>2</sup>, Mitike Molla<sup>3</sup>

### Abstract

**Background:** Healthcare providers can serve as role models to facilitate a supportive environment that encourages women to utilize screening for cervical cancer. Equally important is that being a female healthcare professional does not prevent the risk of cervical cancer. Therefore, this study aims to assess the intention of screening with visual inspection of acetic acid (VIA) and its determinants among female healthcare professionals (HCPs), guided by the trans-theoretical model (TTM) of stages of behavior change.

**Method:** A cross-sectional study design was used to test readiness for cervical screening among selected female HCPs. A structured, self-administered questionnaire was used to collect data. The analysis included descriptive statistics and logistic regression.

**Result:** Four hundred sixty female HCPs with a mean age of  $M=33.8, \pm 5$  years participated. The intention to participate in cervical cancer screening was 44.1%. Over (half 52% of the participants) had poor knowledge of cervical cancer and screening. Regarding the TTM stages of change, 46.5% of participants indicated being in the pre-contemplation phase, suggesting they had never a VIA screen and had no intention of being screened within the next six months. In the final logistic regression model, four factors, including age, being screened in the past three years, taking care of patients with cervical cancer, and having good to moderate knowledge of cervical cancer and screening, were statistically significant, with large odds ratios for their association with intention to screen.

**Conclusions:** Most of the participants were in the pre-contemplation phase, and the limited knowledge health workers had about cervical cancer screening is worrisome. Intervening in the factors that affect intention for screening is vital to reducing barriers to cervical screening among female healthcare workers as well as the broader female population in Ethiopia. Providing cancer screening guidelines to all HCPs, regardless of their specialty, could be a key factor in lessening the burden of cervical cancer. [*Ethiop. J. Health Dev.* 2023; 37(1) 000-000]

**Keyword:** Intention, trans-theoretical model, health care professionals, visual inspection with acetic acid

### Introduction

Cervical cancer is a global health concern (1). Worldwide, cervical cancer ranks as the fourth most common malignancy in women, with more than half a million women diagnosed annually and contributing to over 300,000 yearly deaths (2, 3). Approximately 85% of the worldwide deaths from cervical cancer occur in developing countries, and the death rate is 18 times higher in low- and middle-income countries (LMICs) compared with developed countries (3). There are an estimated 7,000 new cases of cervical cancer in Ethiopia annually; with nearly 5,000 deaths reported (4).

Detection of cervical cancer at an early stage is associated with excellent survival, but most women in developing countries present with advanced and often untreatable diseases, with very low survival rates (5). The disease is largely preventable if regular screening is performed. Regular screening is the single most important public health strategy to reduce cervical cancer incidence and subsequent mortality (6). Approximately 90% of cervical cancers occur in LMICs that lack organized screening programs. In high-income countries, cervical cancer incidence and mortality have been reduced by 50% over the past 30 years since the introduction of formal screening programs (2). Despite the negative clinical outcomes

associated with cervical cancer in Ethiopia, approximately 27.19 million women are estimated to be at risk. Less than 1% of women between the ages of 18-69 years receive the recommended screening every 3 years, as recommended by the WHO (2014) and adopted by Ethiopia (7-9). Effective, low- resource screenings and treatment methods are recommended in the WHO guideline, which includes using a “see and treat” screening strategy with visual inspection with acetic acid (VIA) as the primary screening method and cryotherapy as a treatment option (10).

Although the importance and effectiveness of cervical cancer prevention with screening are well established, the underlying reasons why the majority of women who are not utilizing available screening services have not been well described. Low levels of awareness and poor knowledge, coupled with a lack of available cervical cancer screening (CCS) services, are likely responsible for a very small number of women being screened (9).

The low prevalence of early cervical cancer screening and limited access to its treatments are largely attributed to differences in diagnosis and subsequent mortality from the disease in low-income countries. Given the poor screening status of women in Ethiopia, calls to address these missed opportunities for CCS

<sup>1</sup> Department of Midwifery, School of Nursing & Midwifery, Addis Ababa University, Addis Ababa, Ethiopia

<sup>2</sup> Nell Hodgson Woodruff School of Nursing, Emory University, Atlanta, USA

<sup>3</sup> Department of Preventive Medicine, School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

\*Corresponding author email: semitaye@yahoo.com or semarya.berhe@aau.edu.et

have been made by responsible stakeholders. Healthcare workers are at the core of efforts to improve screening uptake. Evidence demonstrates that healthcare provider recommendations are a key driver of CCS uptake, especially in situations where an individual's motivation may be inadequate (11). Certainly, healthcare providers, as role models in the healthcare system, are expected to facilitate a supportive environment that encourages women to utilize screening.

Research to date indicates that the availability of screening services alone is inadequate to increase screening participation (8, 12). From a social cognitive perspective, an important implication is that different cognitions may be important at different stages in promoting health behaviors (13). Several theoretical perspectives could be used to explore the determinants of healthcare professionals' behaviors. Consequently, it would be useful to obtain a better understanding of the individual mechanisms of the adoption of new behaviors from social cognitive theories (14). Some behaviors and beliefs may have a significant impact on females' decisions to take preventive actions against cervical cancer (13). Intentions are states in which a person is set to act. Being in the intended state takes one closer to health behavior action (15). To address intention, which changes with time, and to avoid subjectivity, we used the trans-theoretical model to determine the stages of change and intention of cervical cancer screening with visual inspection using acetic acid (VIA). The trans-theoretical model (TTM) of behavior change was used to address the stages of readiness to practice regular cervical screening among female healthcare workers in Ethiopia (16).

Stages of change theory is some of the most important theoretical frameworks that are useful in assessing an individual's readiness to perform a variety of health behaviors, including screening (17). Research demonstrates that intention is a valid proxy measure for behavior among clinicians (i.e., physicians, nurses, pharmacists, and other health workers) (14). Women can be described as having a series of stages of readiness to practice regular VIA test screening: (a) pre-contemplation: never had a VIA test and any intention to have one within the next 6 months; (b) contemplation: never had a VIA test but intends to have one within the next 6 months; (c) preparation: never had a VIA test but intends to have one within the next month; (d) action: had one VIA test in the past year and intends to continue getting regular VIA tests; (e) maintenance: had regular VIA tests and intends to continue to do so; (f) relapse risk: on schedule, but no intention to get one in the future; and (g) relapse: had VIA tests in the past, none in the last 3 years, and does intend to get one (16).

Health behavior change is associated with changes in self-belief and self-regulatory skills (18). First, in terms of behavioral intentions, research has consistently shown that the intention to perform a behavior can be translated into actual behavior. For example, research indicates the intention to attend cervical or breast screening activities predicts actual attendance (18).

Also, understanding the competing and motivating factors affecting CCS behavior among women in the context of Ethiopia helps to enhance screening and treatment efforts. Cervical screening among female healthcare professionals guided by the TTM has not been previously examined in Ethiopia. Researching the intention and looking into pre-existing factors towards the intention of screening among health care professionals at Addis Ababa University College of Health Sciences will contribute to the existing knowledge, bridge the gap to low cervical screening participation, and hopefully lead to a decrease in morbidity and mortality due to the problem. Also, for effective screening and prophylaxis, it is of utmost importance to understand the intention of the healthcare staff, as they constitute an important source for communicating health-related information.

## **Methods**

### ***Study setting***

The study took place at the College of Health Sciences (CHS), Addis Ababa University. In the college, there were 3017 permanently employed staff including 913 academicians (683 male and 230 female), 1204 hospital health staff (457 male and 747 female), and 900 administrative staff. The setting was selected as it is the only teaching and health service provision area inclusive of the greatest healthcare professionals to better meet the aim of the study.

### ***Study design***

An institutionalbased cross-sectional study design was used to describe the intention of cervical cancer screening among health care professionals working at CHS, Addis Ababa University, used the stages of change described in the trans-theoretical model to determine the pre-existing factors affecting the intention of cervical cancer screening.

### ***Source and study population***

All healthcare professionals working in the CHS of AAU were the source populations, and HCPs aged 30 years and older were the study populations.

### ***Sampling Techniques and sample size estimation***

The sampling framework for this study was based on participants' profiles obtained from the Office of Human Resources. Samples were proportionally allocated based on the number of female staff available in the units/ departments. Healthcare professionals who fulfilled the inclusion criteria were approached face – to- face and also used the online platforms of the CHS to fill out questionnaires; those who were available and willing filled out the self-administered questionnaire. The sample size was determined using Epi INFO STAT Calc. sample calculation for the population survey; by considering the expected frequency of 25% obtained prevalence of cervical cancer screening practices from a study on cervical cancer screening knowledge and barriers among women in Addis Ababa, Ethiopia (19). Assuming population size of 977, 3% marginal error (d), and a 95% confidence interval, hence  $n = 440$ . The total sample size after adding the 10% non-response rate was  $n = 484$ . A total of 484 female healthcare professionals, 30 years of age

and older, working at Addis Ababa University (CHS) were included in this study. Students and non-healthcare professionals working in the study setting were excluded from this study. Data were collected from December 2020 to January 2021.

### Instrumentation

A structured, self-administered instrument was used to collect data from participants; the instrument was adapted from previous studies. It contains questions about:

**Socio-demographic variables included:** age, marital status, living arrangements, income, work experience, profession, and level of education.

**Medical history and clinical practice:** contraceptive use, a history of sexually transmitted disease (STD), history of taking care of patients/family members with cervical cancer, or prior contact with the disease (20).

**Lifestyle:** age first sexual contact, experience with multiple partners, and sexual activity, history of smoking and alcohol use, condom use, and substance use such as chat chewing (20).

**Knowledge of cervical cancer and screening:** We used a previously tested tool by Thapa and Oche (2018) with the internal consistency of the questionnaires, where Cronbach's  $\alpha$  value calculated was 0.90, to elicit knowledge of cervical cancer and screening. Knowledge about cervical cancer was assessed using 28 items to measure; risk factors (5 items), signs and symptoms (5 items), preventive measures (8 items), and its screening (10 items) were included (21, 22). Out of the 28 items used, some items have multiple responses, hence we scored '1' for each correct response and '0' for the wrong responses. The analysis of the total knowledge score was ranked using Bloom's cut-off point. Good knowledge if it comprises a score of 23-28 (80-100 %), moderate with scores of 16-22 (60-79%), and poor if the score was <16 (<60 %) (23).

**Trans-theoretical model (TTM):** Women can be described along a series of stages of readiness to practice regular Pap test screening: For this study, the Pap test was presented by VIA as it is widely available and utilized in practice in Ethiopia. To categorize intention, if respondents checked a response among the different stages (contemplation, preparation, action, and maintenance) they were considered to have the intention to screen. If respondents indicated that a response among the different stages (pre-contemplation, relapse risk, relapse), was considered to have no intention to obtain cervical cancer screening (16).

### Data Processing and Analysis

Data was entered and cleaned using Epidata software version 3.1 and exported to SPSS version 25 for

statistical analysis. Descriptive statistics such as means, standard deviations, and frequencies were calculated. The contributions of the predictors of the outcome variable intent to screen for cervical cancer were examined by performing a logistic regression analysis. Multicollinearity was checked using tolerance and the variance inflation factor (VIF). Variables with a p-value < 0.2 during the bivariate analysis, considering each predictor one at a time, were included in the final model. A multiple logistic regression analysis was computed to consider the conditional effects of factors. Crude odds ratios (COR) were computed for each predictor, one at a time, for the outcome. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were constructed to measure the strength of association between the intent to screen for cervical cancer and the selected predictors combined in the final logistic regression model. For all statistical tests, a p-value  $\leq$  0.05 was considered statistically significant.

### Ethical consideration

The study received ethical approval from the Institutional Review Board (IRB) of Addis Ababa University with protocol number 017/20/Nursing before participants were approached or data collected. Written informed consent was obtained from all participants, and confidentiality of information was maintained.

### Results

#### Socio-demographic characteristics

A total of 484 questionnaires were distributed to study participants. Twenty-four participants failed to return their questionnaires and were excluded from the study. This resulted in a study population of 460 female healthcare professionals with a response rate of 95% working at Addis Ababa University, CHS. The mean age is  $M=33.8, \pm 5.3$  years. The majority of the participants were nurses; 281 (61.1%) and 271 (58.9%) had less than 5 years of work experience, as shown in Table 1.

#### Reproductive health history, lifestyle, and clinical practice of respondents

The mean age of sexual intercourse was  $M= 21.75, 95\% \text{ CI } [21.26, 22.24]$ . One hundred (21.7%) of the participants had multiple sexual partners. Approximately 33.7% (155), of the study's participants have ever given birth, and over all use of condoms was 68.3% (314). Regarding lifestyle, half of the respondents 230(50%) ever used alcohol. Concerning clinical characteristics only 110(23.9%) participants had ever been screened for CC, and among these 74(67.3%) had received CC screening in the past three years, as shown in Table 1.

**Table 1: Socio-demographic, medical history, clinical practice, and lifestyle characteristics of health care professionals working in the College of Health Sciences Addis Ababa University (n=460)**

Variable	Category	Frequency	Percent %
<b>Age in Years</b> M=33.88, SD=5.29	30 – 34	323	70.2
	35 – 39	88	19.1
	40 – 44	20	4.3
	≥45	29	6.3
<b>Marital status</b>	Never married	230	50.0
	Married	206	44.8
	Widowed and divorced	24	5.2
<b>Service in years</b> M=6.71, SD=6.03	< 5	271	58.9
	5 -10	126	27.4
	>10	63	13.7
<b>Educational level</b>	BSc	294	63.9
	MD	49	10.7
	MSc and above	117	25.4
<b>Monthly income in Ethiopian birr</b> M=7704, SD=5564	<6193	193	42
	6194–9056	171	37.2
	>9056	96	20.9
<b>Professional stream</b>	Clinical	385	83.7
	Academic	75	16.3
<b>Professional title</b>	Nurse	281	61
	Midwife	39	8.5
	Physician	55	12
	Others*	85	18.5
<b>Unit of work</b>	Oncology	55	12
	Medical-Surgical	356	77.4
	Outpatient	28	6.1
	Others**	21	4.6
<b>Age at first sexual contact n= 411</b> M=21.75, SD=3.455	12 -21 years	218	53
	>21 years	193	47
<b>Ever had multiple sexual partners</b>	Yes	100	21.7
<b>Ever use condom</b>	Yes	314	68.3
<b>Ever drink alcohol</b>	Yes	230	50
<b>Ever use the substance (chat chewing)</b>	Yes	28	6.1
<b>Ever smokes cigarette</b>	Yes	28	6.1
<b>Ever used oral contraceptives</b>	Yes	107	23.3
<b>History of STI</b>	Yes	20	4.3
<b>Ever gave birth</b>	Yes	155	33.7
<b>Know someone diagnosed with CC</b>	Yes	113	24.6
<b>Ever taken care of a patient with CC</b>	Yes	153	33.3
<b>Ever been screened for CC</b>	Yes	110	23.9
<b>Screened for CC in the past 3 years</b>	Yes	74	67.3

**Knowledge of cervical cancer and screening**

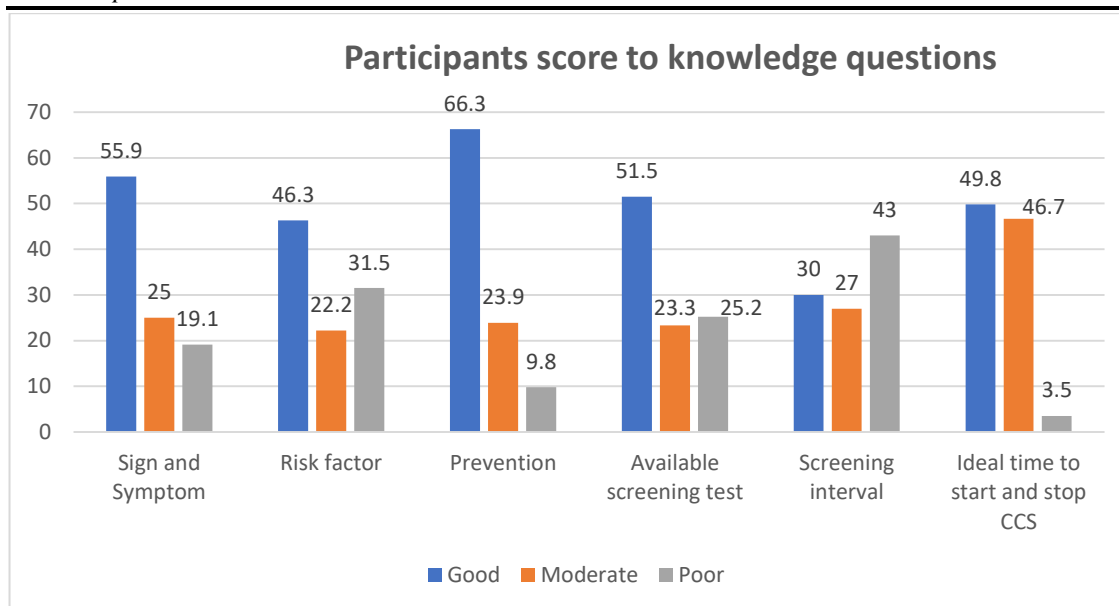
The majority 275 (59.8%) of the respondents did not regard “Visual inspection with acetic acid (VIA)” as one of the screening methods for cervical cancer. With regard to screening frequency, the majority (357 (77.6%) and 454 (98.7%) of the participants misidentified it as “every year” and “every 10 years,” respectively. Healthcare professionals in this study had

a mean knowledge of M=15.63, +SD 3.14, out of a possible range of 0 to 28. Based on knowledge scores, 239 (52%) of the respondents had poor knowledge with regard to cervical cancer and screening. The source of information regarding cervical cancer for more than three-quarters of the respondents 363 (78.7%) was regular course work, and 64 (13.9%) participated in additional training refer to Table 2 and Figure 1.

**Table 2: Frequency of correct answers for items about knowledge on cervical cancer among health care workers Addis Ababa University, (n=460)**

Items	Frequency	Percent %
<b>Cervical cancer signs and symptoms (0-5) *</b>		
1. No symptoms in early-stage	181	39.3
2. Post-coital bleeding	295	64.1
3. Post-menopausal bleeding	248	53.9
4. Dyspareunia	179	38.9
5. Increased vaginal discharge	193	42
<b>Risk factors (0-5) *</b>		
1. Multiple sexual partners	370	80.4
2. Multiple pregnancies	130	28.3
3. Tobacco smoking	234	50.9
4. Long-term OCP use	191	41.5
5. HPV infection	306	66.5
<b>Prevention of cervical cancer (0-8) *</b>		
1. No multiple sexual partners	325	70.7
2. Avoiding multiple pregnancies	124	27
3. Use of condoms instead of long-term OCP	183	39.8
4. Avoiding early marriage/early sexual debut	133	28.9
5. HPV immunization	367	66.7
6. Regular cervical screening	297	64.6
7. Proper treatment of sexually transmitted infections	251	54.6
8. Treatable if detected early	435	94.6
<b>Cervical cancer screening *</b>		
<b>Available screening test (0-3)</b>		
1. Pap smear test	320	69.6
2. VIA (Visual inspection with acetic acid)	285	40.2
3. HPV (Human papilloma virus) test	251	54.6
<b>Ideal time to screen (0-1)</b>		
1. At the age of 21 or three years after sexual debut	382	83
<b>Screening interval (0-4) *</b>		
1. PAP test: every three years at ages 21-29 years	305	66.3
2. Co-testing (HPV and Pap): Every five years at the age of 30-65 years	315	68.5
3. Pap alone: Every three years at the age of 30-65 years	414	90
4. HPV alone: Every five years at the age of 30-65	341	74.1
<b>Time to stop cervical cancer screening (0-2)</b>		
1. Aged > 65 years with adequate screening history	174	37.8
2. Women who have had a total hysterectomy	122	26.5
<b>Total knowledge score for cervical cancer and screening (0-28)</b>		
<b>M= 15.63, SD=3.14</b>		
Good knowledge (23-28, 80-100%)	18	3.9
Moderate Knowledge (16-22, 60-79%)	203	44.1
Poor knowledge (<16, <60%)	239	52

\*Multiple responses were possible, **OCP**: oral contraceptive, **Pap**: Papanicolaou smear test



**Fig 1: Graphical presentation of participants' knowledge score on cervical cancer and screening**

#### Intention to participate in cervical cancer screening using TTM stages of change

Two hundred-fourteen (46.5%) of the study participants were in the pre-contemplation phase; they had never a VIA and had no intention of having one within the next six months. Of the participants: 76 (16.5%) were in the contemplation phase, 43 (9.3%) were in the preparation phase, 39 (8.5%) were in action and

45 (9.8%) were in the maintenance phase, where participants intended to have screening within six-month, month and continue to get regular screening, respectively. The overall intention among female healthcare professionals was 203 (44.1%). More than half 257 (55.9%) of the participants had no intention of screening for cervical cancer, see Table 3.

**Table 3: Trans theoretical model stages of change classification on intention to screen for cervical cancer (VIA) among female health care professionals working at Addis Ababa University, n=460**

Stages of change	Description	Frequency	Percent %
<b>Precontemplation</b>	Never had a VIA and no intention to have one within the next six months	214	46.5
<b>Contemplation</b>	Never had a VIA but intends to have one within the next six months	76	16.5
<b>Preparation</b>	Never had a VIA but intends to have one within the month	43	9.3
<b>Action</b>	Had one VIA in the past year and intends to continue getting regular VIA	39	8.5
<b>Maintenance</b>	Had regular VIA and intends to continue to do so	45	9.8
<b>Relapse risk</b>	On schedule, but no intention to get one in the future	23	5.0
<b>Relapse</b>	Had VIA in the past, none in the last three years, and does not intend to get one	20	4.3

#### Factors associated with intention to screen for cervical cancer

In bivariate analysis (considering each factor one at a time relative to intent to screen for cervical cancer), the following factors from socio-demographic items (monthly income, marital status, service year, educational level, age, unit of work, professional stream), reproductive history (oral contraceptive use, history of sexually transmitted infections, ever gave birth, sexual experience status, ever been screened and being screened in the past three years), clinical (know

anyone diagnosed with cervical cancer, history of caring for a patient with cervical cancer) and knowledge of cervical cancer and screening showed significance value at p-value < 0.2. In the final logistic regression model, we found that only four of the variables, namely participants' age, being screened in the past three years, taking care of patients with cervical cancer, and knowledge of cervical cancer and screening, had a significant association with intention to screen for CC at a p-value < 0.05 shown in Table 4.

**Table 4: Factors associated with intention of cervical cancer screening with VIA among health care workers, at Addis Ababa University College of health sciences**

Variables	n (%)	Intention to screen for CC		OR (95% CI)		P-value
		Yes	No	COR (95%CI)	AOR (95%CI)	
<b>Age in years</b>						
30-34	323(70.2)	116(57.1)	207(80.5)	.13(.06-.28)	<b>.084(.021-.342)</b>	<b>.001</b>
35-39	88(19.1)	47(23.2)	41(16)	.13(.06-.31)	<b>.167(.039-.703)</b>	<b>.015</b>
40-44	20(4.3)	14(6.9)	6(2.3)	.23(.09-.54)	.204(.037-1.84)	.069
≥45	29(6.3)	26(12.8)	3(1.2)	1	1	
<b>Screened in the past three years</b>						
Yes	74(16.1)	67(33)	7(2.7)	17.59(7.85-39.39)	<b>13.124(5.559-30.984)</b>	<b>&lt;.001</b>
No	386(83.9)	136(67)	250(97.3)	1	1	
<b>Took care of a patient with CC</b>						
Yes	153(33.3)	105(51.7)	48(18.7)	.44(.28-.68)	<b>3.361(2.074 -5.445)</b>	<b>&lt;.001</b>
No	307(66.7)	98(48.3)	209(81.3)	1	1	
<b>Knowledge of CC and screening</b>						
Good	18 (3.9)	13(6.4)	5(1.9)	6.03(2.07-17.54)	<b>4.758(1.339-16.906)</b>	<b>.016</b>
Moderate	203 (44.1)	118(58.1)	85(33.1)	3.22(2.17-4.76)	<b>2.280(1.412-3.681)</b>	<b>.001</b>
Poor	239 (52)	72(35.5)	167(65)	1	1	

CC: cervical cancer, COR: Crude Odds Ratio, AOR: Adjusted Odds Ratio

Participants in the 30-34- and 35-39-year-old age groups were 91.6 % and 83 % less likely to have the intention to receive screening for CC [AOR (95 % CI) =0.084, (0.021, 0.342)] [AOR (95% CI) = 0.167, (0.039, 0.703)], respectively, compared to those who were 45 years old and above.

The odds of having the intention to screen for CC were 3.4 times higher among participants who took care of patients with cervical cancer than among those who didn't have a history of care for CC patients [AOR (95% CI) =3.361, (2.074, 5.445)]. Similarly, healthcare providers who have been screened in the past three years were 13 times more likely to have the intention to screen [AOR (95% CI) =13.124, (5.559, 30.984)] than their counterparts who have not been screened.

The odds of having the intention to screen for CC among participants who had good knowledge was 4.8 [AOR (95% CI) =4.758, (1.339,16.906)] and with moderate knowledge were 2 times higher [AOR (95% CI) =2.280, (1.412,3.681)] than those with poor knowledge.

### Discussion

The study found that less than half of the female healthcare professionals surveyed had the intention to undergo cervical cancer screening. Factors that predicted a greater likelihood of those who would undergo CCs included older age groups and previous experience, including those who had been screened in the past three years and previously provided care to a cervical cancer patient., The intention to screen was more likely among those who had better knowledge of cervical cancer and screening.

Intention to be screened for CC was low, with over 50% indicating they had no intention of being screened. The findings are similar to those of a previous study conducted among Ethiopian women whose reported intention for cancer screening was 45.3% (24). Other studies from Southwest Ethiopia

attending a gynecology outpatient clinic revealed that only 29.9% had an intention to get screened (25). These findings suggest that CCS rates are exceedingly low in Ethiopia, and whether specialist care improves rates remains an area for further research.

Studies have documented that several demographic factors contributed to the low uptake of cervical screening (26). Results from this study revealed that cervical cancer screening intention was associated with age. The intent of health care professionals in their 30's (30-39 years) had a 99 % lower probability of having VIA screening compared to women 45 years and older. These findings are supported by studies in Nigeria, Botswana, and Addis Ababa, Ethiopia, showing a significant association between the increasing age of respondents and the uptake of CCS (22). A systematic review study conducted in Nigeria among female healthcare providers documented increasing age as a facilitator of screening (27). Study findings from Australia, India, and Ethiopia have also indicated that a woman's age is a major predictor for participating in CCS (10, 28). Older participants were more likely to undergo an annual health check and could seek out and read health promotion material compared to younger participants (29). Exploring age differences in health behaviors is an important step towards understanding preventive practices and future education needs in Ethiopian women. Herbert et al 2008 found that delaying the age of cervical screening increases the risk of cervical cancer becoming more extensive and advanced stage which is more difficult to treat (30). It would seem prudent for regular screening to begin at an earlier age, and attending screening programs may provide an excellent opportunity for education on preventive health care.

It is well established that knowledge does not always translate into behavior, but improved knowledge has been found to increase the rate of cervical cancer screening in most research settings (31). Current research shows health professionals' knowledge is

implicated in screening uptake; those with good or moderate knowledge of CC and screening were more likely to participate in screening. This is supported by a study in Ethiopia showed women with better knowledge of cervical cancer and their screening were 2.3 times more likely to utilize screening services than women who were not knowledgeable (10). Cervical cancer screening uptake in Sub-Saharan Africa: a systematic review and meta-analysis; a meta-analysis of seven studies revealed that knowledge about cervical cancer screening was significantly associated with cervical cancer screening (32). Studies conducted in Tanzania and Botswana also found that greater knowledge of cervical cancer and its prevention increased the odds of screening uptake by about 9 and 3 times, respectively (33, 34). Studies carried out in China reported that women who were willing to undergo CCS had higher knowledge levels (35, 36). A study among childbearing women in Ethiopia disclosed that respondents with poor knowledge were significantly less likely to seek preventive health measures or control cervical cancer (37). A systematic review study conducted in Uganda found that adequate knowledge of at least one screening method was significantly associated with having been screened or having the intention to screen (38).

Health providers play numerous roles in the overall well-being of their patients. In addition to assisting with physical needs, healthcare providers offer advice and direction for illness prevention and injury prevention. The low knowledge level of cervical cancer and screening found in this study is surprising considering the profession of the respondents, as they are expected to be more knowledgeable than other women in the community. Training among study participants concerning CC was low and may play an important role in the knowledge gap concerning CCS. Countries wishing to implement new, or strengthen existing, cervical cancer prevention programs must build local capacity to do so. By necessity, these countries generally rely on the in-service training of existing providers, which is the most efficient way to quickly generate sufficient numbers of competent providers (39). In-service training is essential to developing a sense of efficiency and effectiveness in one's capability to engage in health promotive strategies including regular CCS.

Our study found that the odds of having an intention to screen for CC were 3.4 times higher among participants who took care of patients with cervical cancer. A systematic review done in Uganda revealed that having known somebody with CC, or somebody who had undergone CCS was a motivating factor for women to access screening (38). In a study among nurses in Addis Ababa, those who had previously taken care of a patient diagnosed with cervical cancer were two times more likely to practice preventive measures, including routine screening (40). Another study of nurses in Turkey reported there was a significant relationship between utilizing a Pap test and having a family history of cancer ( $p < 0.05$ ) (41). Personal experiences and involvement with CC patients or family members may be a mechanism for

increasing screening by having women share their experiences in public or community venues.

Healthcare providers that were screened over the past three years had a 13-fold greater likelihood of intending to participate in CCS than those who were not screened. Of note, approximately half of the cervical cancers diagnosed in the United States are among women who were never screened, and an additional 10% of cancers occur among women who were not screened within the past five years (42). Screening for cervical cancer: a systematic review and meta-analysis that pertain to the effectiveness of screening for reducing cervical cancer mortality and incidence, as well as the optimal timing and frequency of screening, highlights A randomized controlled trial in India showed even a single lifetime screening test significantly decreased the risk of mortality from and incidence of advanced cervical cancer compared to no screening (43). The largest immediate gain in reducing the burden of cervical cancer incidence and mortality in Ethiopia may be attained by increasing screening access (regardless of the test used) among women who are currently unscreened or screened less frequently.

In this study, predictors such as level of education, marital status, income, work experience, and sexual experience did not have statistical significance for the intention to screen for CC among healthcare professionals. This might be related to the fact that the majority of studies that came with this result assessed women in general not health care professionals, and it could also be explained by the difference in time and place of the studies conducted.

### Conclusions

The findings from this study suggested that the intention to screen for cervical cancer among female healthcare professionals was low in one of the largest academic health science centers in Ethiopia. The observed poor knowledge and low uptake of CCS in our study population of educated female healthcare professionals are of great concern and may potentially hurt the attitudes of the general population of women in Ethiopia towards the utilization of the screening procedure. Since nurses and medical clinicians make up the largest percentage of healthcare providers, their integration and participation in cervical cancer screening approaches are vital for behavioral change. The study findings may also fill a gap in the existing knowledge, help policymakers when they make decisions that facilitate their intention to screen for cervical cancer and serve as an important tool to develop comprehensive cervical cancer, prevention programs to increase utilization of screening services. Further research is needed on why female healthcare professionals have a negative view of CCS and if these attitudes incorporate other preventive practices in Ethiopia, such as breast cancer screening and other forms of cancer screening. There needs to be a discussion in communities and at the national policy level on how to best meet the needs of the women of Ethiopia by increasing access to cervical screening.



**Conflict of interest**

The author(s) declared that they have no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

**Funding statement**

Addis Ababa University and the Office of the Director for Research, in collaboration with SIDA Grant Coordination, Addis Ababa University women researchers funded this work (reference number, RD/LT-159/2019).

**Acknowledgment**

Our heartfelt gratitude goes to Addis Ababa University and SIDA for their financial support. The authors would like to thank the individuals who participated in this study and Dr. Deborah Bruner, Emory University, for reviewing the manuscript.

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