ORIGINAL RESEARCH

Knowledge about cervical cancer screening and its practice among female health care workers in southern Ethiopia: a cross-sectional study

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Background: Cervical cancer remains a major cause of morbidity and mortality among the women in the world. Early screening for cervical cancer is a key intervention in reduction of maternal deaths. Health care workers have a significant contribution to improve cervical cancer screening practice among women. Hence, this study aimed to assess the knowledge and practice of cervical cancer screening among female health care workers in southern Ethiopia.

Methods: Institution-based cross-sectional study was conducted during March and April, 2015. All hospitals in Hawassa city administration and Sidama zone were purposively selected. A simple random sampling technique was used to draw the health centers. After proportional allocations to their respective health facilities, a total of 367 female health workers were selected by simple random sampling technique. A structured and pretested questionnaire was used to collect the data. Data were entered to SPSS version 20.0 for further analysis. Logistic regression analyses were used to see the association of different variables.

Results: Out of the total respondents, 319 (86.9%) had a good level of knowledge on cervical cancer. Similarly, a majority of them, 329 (89.6%), 321 (87.5%), and 295 (80.4%), knew about the risk factors, symptoms, and outcomes of cervical cancer, respectively. More than two thirds of the respondents, 283 (77.1%), knew that there is a procedure used to detect premalignant cervical lesions and 138 (37.6%) of them mentioned visual inspection with acetic acid as a screening method. In this study, only 42 (11.4%) of the respondents were screened for cervical cancer (confidence interval [CI]: 8.7, 13.9). Being a physician (adjusted odds ratio [AOR] =0.12, 95% CI: 0.02, 0.79) and working in a cervical cancer screening center (AOR =0.14, 95% CI: 0.03, 0.68) had a lower odds of cervical cancer screening practices.

Conclusions: Significant numbers of health care workers were knowledgeable on cervical cancer. Cervical cancer screening among health care workers in southern Ethiopia was found to be low. Being a physician and working in a screening center had lower odds of cervical cancer screening practice. In spite of having adequate knowledge on cervical cancer the reasons for low practice of cervical cancer screening among health care workers needs to be investigated.

Keywords: cervical cancer, health care workers, southern Ethiopia

Background

Globally, cervical cancer is the third most frequent cancer among women.[1] Each year, an estimated half million new cases are diagnosed with ~275,000 deaths in 2008 alone.[2–5] Low-resource countries account for 85% of the cases, yet very little is spent in preventing and treating cervical cancers.[1–3] Similarly, it is the most common and most lethal cancer among the women of sub-Saharan Africa.[6] A considerable reduction in cervical cancer incidence and deaths has been achieved in developed countries

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with effective strategies for cervical cancer screening and treatment programs.[7–9] However, this has not been possible in most resource-limited countries, mainly because systematic screening is rarely performed.[10–13]

In Ethiopia, cervical cancer ranks as the most frequent cancer among women and cause for 4,732 deaths annually.[1,14–16] Among the general population, ~33.6% of women are estimated to harbor cervical human papilloma virus (HPV) infection at a given time.[2,16] Despite this fact, very few health workers receive cervical cancer screening services in Ethiopia.[13,17–19] Besides, there is an obvious need among female health care providers for training about cervical cancer etiology, risk factors, and prevention techniques.[13,19]

Cervical cancer screening has been consistently shown to be effective in reducing the incidence rate or the occurrence of new cervical cancer cases and mortality from cervical cancer.[2] However, cervical screening attendance rates are still far from satisfactory in many countries.[3–5,13] Perhaps, cervical cancer screening facilities are limited because of poor infrastructure, staff, poor knowledge about cervical cancer, and illiteracy; the uptake of cervical cancer screening is poor among women who live in the places where the screening facilities are available.[13,19,20–27] Challenges of cervical cancer screening in developing countries include limited access to health services and laboratories, no screening programs, limited or nonexistent awareness among populations and health workers, and poor referral and follow up.[2,13,28–30]

Data regarding having a poor attitude toward cervical cancer screening among health care providers were reported in Ethiopia.[13,19] Health care workers were anticipated to be knowledgeable about cervical cancer screening compared to non-health care workers and consequently to persuade cervical cancer screening among women.[13,29–35] The primary screening method adopted by the Government of Ethiopia is the visual inspection with acetic acid applied to the cervix by health care providers. An accurate diagnosis depends on the ability of the provider to visualize the cervix properly and differentiate between cervical lesions.[36] Moreover, in order to advance preventive practice for cervical cancer, health care workers should be knowledgeable and improve their personal conformity with the recommended practice.[13,31] For instance, antenatal care education by health care providers was suggested as a means of improving knowledge and uptake of cervical cancer screening services.[30] Hence, this study aimed to assess the level of knowledge about cervical cancer screening and its practice among female health care workers in southern Ethiopia.

Methods
Study setting and population
The study was carried out among female health workers in the Sidama zone from March 15 to April 15, 2015. Sidama zone is the largest zone in the state covering 6,972.1 square kilometers with a total population of 3,019,442. The zone has 21 woreda (districts). The capital of the zone, Hawassa city, is located 275 kilometers to the south of Addis Ababa (capital of the country) and it is the regional capital of the state. In the zone, there are four governmental hospitals and 107 public health centers. Hawassa city administration, the capital city of the state, and Sidama zone contain two hospitals and nine health centers. The numbers of health professionals working in the public health facilities in the state are 228 medical doctors (general practitioners and specialists), 1,280 midwives, 1,331 health officers, 8,756 nurses, and 8,051 health extension workers. All female health workers comprising doctors, nurses, midwives, pharmacy technicians, pharmacists, and medical laboratory technicians and technologists, aged between 15 and 65 years, and employed in the Sidama zone were considered as the source population, while those who were employed in the selected health institution were considered as the study population.

Study design
An institution-based cross-sectional study design was conducted to assess the level of knowledge about cervical cancer screening and its practice among female health care workers in southern Ethiopia.

Sample size and sampling procedure
The sample size was calculated using single population proportion formula, $n = (z_{(\alpha/2)})^2 \, p \, (1-p)/d^2$, by considering the following assumptions: n = sample size, z = standard normal deviate set at 1.96 (for 95% confidence level), d = desired degree of accuracy (0.05), and p = proportion of cervical cancer screening practice =34.6% from previous study.[32] Hence, the total sample size with 10% nonresponse rate became 382.

A simple random sampling technique was employed to select ten health centers among 116 public health centers in the Sidama zone and Hawassa city administration. All hospitals in the Sidama zone and Hawassa city administration were purposively included in the study. The total numbers of female health care workers in each group of professions (namely doctors, nurses, midwives, pharmacists and pharmacy technicians, medical laboratory technologists,

and technicians) in these 16 health institutions during the study period was 1,342 (data obtained from each institution by principal investigator via preliminary survey). Then, the sample was allocated to the selected health institutions proportional to the number of female health workers in the respective health institutions. Finally, a simple random sampling technique was used to select a total of 382 female health care workers.

Data collection instruments

A pretested and structured self-administered questionnaire was used for data collection. The collected data were checked for completeness and consistency by the investigator and supervisor. Different relevant literature was reviewed to develop the tool that addresses the objective of the study.[2,5,11–13,22–39] The instrument was pretested on 40 study participants who were working in other health facilities that were not part of the actual study. Findings from the pretest were used to modify the instrument in terms of clarifying the questions. The questionnaire was designed to obtain information on the sociodemographic, reproductive, and professional characteristics of the respondents, knowledge about cervical cancer, and health workers' cervical cancer screening history. Knowledge about cervical cancer was measured by using 12 knowledge questions about risk factors, symptoms, treatments, and outcomes of cervical cancer. To produce a more objective assessment of knowledge about cervical cancer, a scoring method was devised and a knowledge score for each participant was obtained by summing up the score for correct responses given to the selected questions in the questionnaire. A score of mean value or above (≥ 6) to these questions was considered as a good level of knowledge, otherwise lower scores were taken as poor level of knowledge. Five BSc nurses facilitated the data collection process. They were given 1 day training before the actual work, about the aim of the study, procedures, and data collection techniques.

Data processing and analysis

The collected questionnaire was checked manually for its completeness, coded, and entered into Epi-Info version 3.5.4 statistical package, then exported to SPSS version 20.0 for further analysis. Descriptive and summary statistics were done. Both bivariate and multivariate logistic regression analyses were used to determine the association of each independent variable with the dependent variable. Variables significant in bivariate analysis (P-value ≤ 0.2) were entered into a multivariate logistic regression model to adjust the effects of confounders on the outcome variable. Odds ratios with their 95% confidence intervals (CIs) were computed to identify the presence and strength of association, and statistical significance was declared if $P < 0.05$.

Results

Sociodemographic characteristics of the respondents

A total of 367 health care workers were included in the study with a response rate of 96.1%. The mean age of the respondents was 28.2 years (standard deviation =6.4). Regarding ethnicity, 118 (32.2%) of them were Sidama and more than half, 196 (53.3%), of them were protestant religion followers. One hundred eighty-one (49.3%) of them were married. Nearly two thirds, 225 (61.3%) and 237 (64.6%), of them were nurses by profession and working in the hospital, respectively. Two hundred fifty-seven (70%) and 304 (82.8%) of the respondents had a diploma and working experience of 1–5 years, respectively. One hundred seventy-one (46.6%) of the partners were government employed and only 78 (21.3%) of them had a BSc. The majority, 266 (72.5%), of the respondents had an income of more than 2,000 birr (Table 1).

Reproductive health history of the respondents

The mean and minimum age at first menstruation of the respondents was 14.2 and 9 years, respectively. Similarly, the mean and minimum age at first sexual intercourse was 19.1 and 12 years, respectively. More than half, 196 (53.4%), of them had first sexual contact at age of 19 years and above. About half, 180 (49%), of the study participants were nulliparous woman. Regarding their circumcision status, the majority of the respondents, 271 (73.8%), and most of their partners, 337 (91.8%), were circumcised. All respondents who participated in the study had never smoked cigarettes. The majority, 317 (86.4%), of them did not have multiple sexual partners. In addition, 73 (19.9%) of the respondents had used combined oral contraceptive pills (Table 2).

Knowledge about cervical cancer

Three hundred nineteen (86.9%) health workers had a good level of knowledge on cervical cancer. Most of the respondents, 341 (92.9%), had heard about cervical cancer. Regarding the source of information about cervical cancer, 232 (63.2%) had heard from school/college, 107 (29.2%) from news/media, 80 (21.8%) from friends/colleagues,

Table 1 Sociodemographic characteristics of respondents, Sidama zone, southern Ethiopia, 2016 (n=367)

Variables	Frequency	Percentage
Age in years		
18–24	104	28.3
25 and more	263	71.7
Ethnicity		
Sidama	118	32.2
Amhara	84	22.9
Oromo	71	19.3
Gurage	44	12
Wolaita	27	7.4
Others*	23	6.2
Religion		
Protestant	196	53.3
Orthodox	154	42
Muslim	12	3.3
Catholic	5	1.4
Marital status		
Single	154	42
Married	181	49.3
Cohabitation	6	1.6
Separated	13	3.5
Divorced	8	2.2
Widowed	5	1.4
Health facilities		
Health center	130	35.4
Hospital	237	64.6
Profession		
Nurse	215	58.6
Midwife	68	18.5
Laboratory	36	9.8
Pharmacy	20	5.4
Physician	18	4.9
Health officer	10	2.8
Qualification level		
Diploma	257	70
BSc	102	27.8
MSc and above	8	2.2
Experience (years)		
1–5	304	82.8
6–10	44	12
11 or more	19	5.2
Partner's occupation		
Government employed	171	46.6
Self-employed	11	3.0
Partner's education level		
Unable to write and read	3	0.8
Elementary (1–8)	2	0.5
Junior (9–12)	4	1.1
Diploma	47	12.8
BSc	78	21.3
Masters and above	50	13.6
Income		
<1,000 birr	9	2.5
1,000–2,000 birr	92	25.0
>2,000 birr	266	72.5

Note: *Kambata, Hadiya, Tigre.

Table 2 Reproductive health history of the respondents, Sidama zone, southern Ethiopia, 2016 (n=367)

Variables	Frequency	Percentage
Age at first sexual contact (years)		
12–18	171	46.6
19 and more	196	53.4
Circumcision status		
Circumcised	271	73.8
Not circumcised	96	26.2
Partner circumcision status		
Circumcised	337	91.8
Not circumcised	30	8.2
Cigarette smoking		
Yes	367	100
No	0	0
Multiple sexual partners		
Yes	50	13.6
No	317	86.4
Ever used contraceptive methods		
Yes	203	55.3
No	164	44.7
Contraceptive methods ever used		
Combined oral contraceptive	73	19.9
Injectable	63	17.2
Implants	46	12.5
Intrauterine devices	18	4.9
Progesterone-only pills	3	0.8

and 40 (10.9%) from brochures/posters, while six (1.6%) of them had heard from a religious institution. Most of the respondents, 353 (96.2%), knew that cervical cancer was not communicable. Similarly, 299 (81.5%) and 140 (38.1%) of them knew that cervical cancer was preventable and were aware of its prevention methods, respectively. More than half, 207 (56.4%), of them knew that avoiding multiple sexual partners prevents cervical cancer. In addition, 223 (60.8%) and 133 (36.2%) of them knew that early screening and vaccination for HPV could prevent cervical cancer, while 291 (79.3%) and 271 (73.8%) of them stated using holy water and praying to god as the prevention methods. A significant number of the respondents, 296 (80.7%), knew that cervical cancer was curable at an early stage. Likewise, a majority of the respondents, 329 (89.6%), 321 (87.5%), and 295 (80.4%), knew about the risk factors, symptoms, and outcomes of cervical cancer, respectively. Among the listed outcomes of untreated cervical cancer, 287 (78.2%) were death, 188 (51.2%) bleeding, and 185 (50.4%) chronic illness, while 210 (57.2%) of the respondents knew about cervical cancer treatments.

Knowledge about cervical cancer screening and its practice

More than two thirds of the respondents, 283 (77.1%), knew that there was a procedure used to detect premalignant

cervical lesions. One hundred thirty-eight (37.6%) of them mentioned visual inspection with acetic acid as a screening method. Similarly, 113 (30.8%) of them mentioned pap smear as a screening method. More than half, 196 (53.4%), of the respondents said that women aged between 36 and 60 years were more likely to be affected by cervical cancer than others. In addition, 63 (17.2%), 17 (4.6%), 16 (4.4%), and 17 (4.6%) of them said that women aged between 26 and 35, 19 and 25, 15 and 18, and >60 years were more likely to be affected by cervical cancer than others. However, 58 (15.8%) of them did not know which age group was more likely to be affected. Regarding the eligibility criteria for cervical cancer screening, 247 (67.3%) of the respondents said that all women aged >21 years should be screened, while 161 (43.9%) of them said that commercial sex workers should be screened. Two hundred twenty-five (61.3%) of them stated that all older women should be screened. A majority of the respondents, 306 (83.4%), knew that the cervical cancer screening test was used to check the health of the cells of the cervix. Regarding the cervical cancer screening services, 158 (43.1%) of the respondents stated that there was no cervical cancer screening test in their institution. A majority of the health care workers, 325 (88.6%), were not screened for cervical cancer. Among those who were screened for cervical cancer, acetic acid test accounted for 18 (42.8%). The result of the screening was negative among all screened respondents. Among reasons for not having screened for cervical cancer, fear of the result and lack of information about cervical cancer screening constituted a significant percentage. One hundred eighty (49.1%) of the respondents stated that no vaccination for HPV was available in their institution, and all study respondents were not vaccinated (Table 3).

Factors associated with cervical cancer screening

In bivariate analysis the factors found to be significantly associated with cervical cancer screening practices were marital status, age, profession, experience, level of education, knowledge about cervical cancer outcome, type of health institution, and working in cervical cancer screening centers. However, in multiple logistic regression analysis, type of profession and working in cervical cancer screening center were significantly associated with cervical cancer screening practices. Those who were physicians were 88% less likely to be screened for cervical cancer than other health care workers (adjusted odds ratio [AOR] =0.12, 95% CI: 0.02, 0.79). Similarly, those who were working in cervical cancer screening centers were 86% less likely to be screened for

Table 3 Cervical cancer screening services among health care workers, Sidama zone, southern Ethiopia, 2016 (n=367)

Variables	Frequency	Percentage
Is there cervical cancer screening services in your health facility?		
Yes	123	33.5
No	158	43.1
I do not know	86	23.4
Number of health care workers assigned in screening center		
1	66	53.7
2 and more	41	33.3
I do not know	16	13.0
Are you working in the screening center?		
Yes	7	5.7
No	116	94.3
Have you ever been screened?		
Yes	42	11.4
No	325	88.6
Types of screening methods		
Acetic acid test	18	42.8
Pap smear test	17	40.5
I do not know	7	16.7
Reasons for not being screened		
Lack of information about screening methods	81	24.9
Fear of the result	86	26.5
I feel shy	44	13.5
I am afraid of screening tests	71	21.8
Religious belief	43	13.3
Is there human papilloma virus vaccination in your institution?		
Yes	11	3.0
No	180	49.1
I do not know	176	47.9
Have you ever been vaccinated for human papilloma virus?		
Yes	0	0
No	367	100

cervical cancer than their counterparts (AOR =0.14, 95% CI: 0.03, 0.68; Table 4).

Discussion

In this study, 319 (86.9%) of the health workers had a good level of knowledge on cervical cancer (CI: 83.9, 89.6). This finding is in line with the study carried out in eastern India (88.8%).[35] However, the current finding is lower than that of the study conducted in Sokoto, Nigeria (98.6%),[22] and higher than that of the studies conducted in Turkey (63.9%),[37] rural India (26.7%),[38] Cotedivoire (55.7%),[26] Tanzania (46%),[24] and South Nigeria (90.5%).[39] These differences might be due to differences in types of health care workers involved in the study, and place and time of the study, which might be explained by the difference in the level of knowledge about cervical cancer. For instance, in the study conducted in Turkey and rural India, only nurses, and in the study of

Table 4 Bivariate and multivariate analyses of factors associated with cervical cancer screening practices among health care workers, southern Ethiopia, 2016 (n=367)

Variables	Cervical cancer screening		OR (95% CI)		P-value
	Yes	No	COR (95% CI)	AOR (95% CI)	
Age in years					
18–24	8	96	1.78 (0.79, 3.99)	*	
25 and more	34	229	I	I	
Marital status					
Single	8	146	I	I	
Married and live together	26	155	0.33 (0.14, 0.74)	*	
Divorced	8	24	0.16 (0.06, 0.48)		
Health facilities					
Hospitals	32	205	0.53 (0.25, 1.12)	*	
Health centers	10	120	I	I	
Profession					
Physician	7	11	0.17 (0.06, 0.48)	0.12 (0.02, 0.79)	0.03
Other health care workers	35	314	I	I	
Level of education					
Diploma	25	232	I	I	
BSc and above	17	93	0.59 (0.30, 1.14)	*	
Experience in years					
1–5	26	276	I	I	
6–10	16	47	0.27 (0.14, 0.55)	*	
Working in screening center					
Yes	4	3	0.16 (0.03, 0.77)	0.14 (0.03, 0. 68)	0.01
No	19	89	I	I	
Knowledge about cervical cancer outcome					
Knowledgeable	37	258	0.52 (0.19, 1.37)	*	
Not knowledgeable	5	67	I	I	

Note: *Not significant in multivariate logistic regression.
Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio; CI, confidence interval; OR, odds ratio.

Cotedivoire, only midwives and health care workers were involved in the study, while different health care workers were involved in our study.

The finding of this study reported that only 42 (11.4%) of the respondents were screened for cervical cancer (CI: 8.7, 13.9). This finding is consistent with the finding of the studies in eastern India (11.6%),[35] Korea (13%),[25] and Ethiopia (10.7%).[13] The current finding is higher than that of the finding in Haiti (4%),[40] rural India (7%),[38] and Ibadan, Nigeria (6.8%);[3] however, it is lower than that of the study carried out among staff nurses in teaching hospitals of India (20%),[33] Cotedivoire (18.4%),[26] Tanzania (15.4%),[24] South Nigeria (27.8%),[39] Maiduguri, Nigeria (23.3%),[12] and Baghdad city (18.8%).[28] A possible reason for this difference might be difference in sociodemographic characteristics of the respondents, which could be explained by the different levels of knowledge and attitude toward cervical cancer screening practices among the respondents. Similarly, time and place of the study is also another possible explanation for this difference.

In the present study, type of health profession was significantly associated with cervical cancer screening. Those who were physicians were less likely to be screened for cervical cancer than other health care workers. This might be due to the fact that most physicians who participated in this study were general practitioners with less working experience relative to other health sciences. Consequently, probability to be screened for cervical cancer might be more likely for those who had more working experience. In addition, working in a screening center was also significantly associated with cervical cancer screening. Those who were working in a screening center were less likely to be screened for cervical cancer than their counterparts. In the context of Ethiopia, cervical cancer screening was often performed by physicians. Consequently, those physicians might have felt shy to be screened by their friends, and fear of a positive result could also be possible. Moreover, a belief about self-care, as well as being negligent, and fear of pain would be additional explanations. Likewise, lack of trust and confidence could

also be another possible reason, where these providers may partially know the service providers.

As a cross-sectional study requires respondents to remember information retrospectively, recall and social desirability bias are the potential limitations of this study. However, numerous scientific procedures have been employed to minimize the possible effects. To reduce the social desirability bias, for instance, the details about the aim of the study were shared with the respondents. In addition, procedures such as supervision and pretest of the data collection tool were utilized.

Conclusions

A significant number of health care workers were knowledgeable on cervical cancer. Cervical cancer screening among health care workers in southern Ethiopia was found to be low. Being a physician and working in a screening center had lower odds of cervical cancer screening practice. Hence, in spite of having adequate knowledge on cervical cancer, the reasons for the low practice of cervical cancer screening among health care workers needs to be investigated.

Declarations
Ethics approval and consent to participate

Ethical approval was obtained from the Hawassa University Institutional Review Board Committee. A permission letter was granted from the Southern Nation, Nationality and People Regional Health Bureau to respective health institutions. Written consent was obtained from each participant prior to data collection. After informing each respondent about the aim and purpose of the study, participants were asked for their voluntary participation. Those respondents were assured they could withdraw from the study anytime if they felt unhappy. They were also informed that all data obtained from them would be kept confidential by using codes instead of any personal identifiers.

Disclosure

The authors report no conflicts of interest in this work.

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