



Awareness and Beliefs About Cervical Cancer, the HPV Vaccine, and Cervical Cancer Screening Among Ghanaian Women with Diverse Education Levels

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Abstract

Cervical cancer is the leading cause of cancer death among women in Ghana. Cost-effective tools for the primary and secondary prevention of cervical cancer, such as the Pap test, the HPV DNA test, and the HPV vaccine, are available in hospitals and clinics throughout Ghana. However, participation in cervical cancer prevention behaviors is low among Ghanaian women. Our objective was to determine if there were significant differences in cervical cancer awareness and stigmatizing beliefs about women with cervical cancer between Ghanaian women of different education levels. We surveyed 288 Ghanaian women who were at least 18 years old. Data on the participants' demographic characteristics, awareness of cervical cancer, cervical cancer screening, and the HPV vaccine, beliefs about cervical cancer screening, and stigmatizing beliefs about women with cervical cancer was collected. Chi-square tests for independence and Fisher's exact test of independence were performed to determine if education level was associated with those factors. Participation in cervical cancer screening and uptake of the HPV vaccine was significantly lower among women with less than a senior high school education. Awareness about cervical cancer, cervical cancer screening, and the HPV vaccine was lower among women with less education. Women with lower levels of education were more likely to agree with the negative statements about cervical cancer screening and stigmatizing beliefs about women with cervical cancer. Cervical cancer education interventions that are tailored for Ghanaian women with different educational levels are needed to increase awareness of and participation in cervical cancer prevention strategies.

Keywords Cervical cancer prevention · Ghana · Women's Health

Introduction

Cervical cancer is the most common cancer and the leading cause of cancer death among women in Ghana, West Africa [1]. Cervical cancer incidence and mortality rates have been steadily increasing despite significant improvements in the quality of health services available in Ghana [1–3]. It is estimated that every year, 3052 Ghanaian women are newly diagnosed with cervical cancer and 1556 Ghanaian women die

from the disease [1]. Projections from the International Agency for Research on Cancer indicate that if the current trends continue, by the year 2020, the annual cervical cancer incidence and mortality rates will be 3759 and 1865 respectively [1, 4].

There are several cost-effective tools, such as the Pap test, the HPV DNA test, and the HPV vaccine, that can be used for the primary and secondary prevention of cervical cancer in low- and middle-income countries (LMICs) [5–10]. These tools are available in hospitals and clinics in urban and rural communities across Ghana [11]. However, the rate of participation in preventive cervical cancer screening is extremely low among Ghanaian women of all socioeconomic levels [1]. The combination of a lack of a national cervical cancer screening program and delays in treatment seeking when symptoms appear contributes to the high incidence of high-grade squamous intraepithelial lesions, and invasive cervical cancer in Ghana [12–14]. The cervical cancer prevention and control guidelines developed by the World Health

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Organization, the International Agency for Research on Cancer, and the African Organization for Research and Training in Cancer state that the prevention, early detection, and early treatment of cervical cancer should be paramount objectives in LMICs [15–17].

Inequalities in participation in cervical cancer prevention behaviors are associated with education status and other socioeconomic factors. However, the majority of studies aimed at assessing cervical cancer awareness among Ghanaian women have only included well-educated women. There is a need to assess the awareness and beliefs about cervical cancer, the HPV vaccine, and cervical cancer screening Ghanaian women of all education levels so that cervical cancer education interventions can be tailored to meet the needs of women with different levels of education. The purpose of this study was to determine if there were significant differences in cervical cancer awareness and stigmatizing beliefs between women of different education levels. We conducted a survey of women in Accra, Ghana, to assess Ghanaian women's awareness of cervical cancer, the Pap test, and the HPV vaccine. We also assessed their beliefs about cervical cancer screening and their beliefs about women with cervical cancer.

Methods

Study Design

We used a cross-sectional study design to conduct the survey of women in Accra. The study was conducted during a 1-week period in July 2015. To reduce instrumentation threat to internal validity, all of the research assistants who administered the questionnaire completed a training session prior to the initiation of participant recruitment. During the training session, the principal investigators oriented them to the study and trained them how to explain the study to potential participants, obtain informed consent, and use iPads to administer the questionnaire.

Participation Selection and Questionnaire Administration

Ghanaian women were eligible to participate in the study if they were at least 19 years old, could hear and speak English or Twi, and had no cognitive difficulties. A convenience sampling plan was used to select the participants. The Raosoft sample size calculator was used to calculate the sample size. We determined that a minimum sample size of 200 participants was for a 95% confidence level and a 6.89% margin of error. Five Ghanaian research assistants recruited participants in public venues, such as markets, churches, and tro tro (mini-bus share taxis) stops, in Accra. The research assistants were multi-lingual and translated the survey from English to Twi

when necessary. All of the participants' responses were recorded in English.

A research assistant reviewed the informed consent form with a participant and obtained her signature or thumbprint prior to administering the questionnaire. To the best of their abilities, the research assistants administered the questionnaires in secluded or private areas (i.e., on the side of a building) to maintain the confidentiality of the participants' responses. Each participant was given 5 Ghana Cedis to compensate her for her time. The questionnaire took an average of 15 min to complete the survey.

Demographic Characteristics

The questionnaire included questions about the participants' demographic characteristics, including age, marital status, and level of education. We also asked questions to assess the women's history of cervical cancer screening and HPV vaccination, and their HIV status.

Awareness of Cervical Cancer, Cervical Cancer Screening, and the HPV Vaccine

Awareness of cervical cancer, cervical cancer screening, and the HPV vaccine were each assessed using single items: "Have you ever heard of cervical cancer," "Have you ever heard about cervical cancer screening tests?" and "Have you ever heard of the HPV vaccine?" A response of "yes" indicated that the participant was aware and a response of "no" indicated that the participant was not aware.

Cervical Cancer Screening Beliefs

Seven items were used to assess the participants' beliefs about cervical screening. These items were selected from a validated scale because they were aligned with beliefs that were identified in previous studies of Ghanaian women, such as "I do not want to expose myself for a cervical cancer screening," and "I am too embarrassed to get a cervical cancer screening [18–20]. A 5-point Likert scale was used to gauge the degree to which the participants agreed with each item. The response options ranged from "Do not agree at all" to "Agree very much." Before the data was analyzed, "Do not agree at all" was recoded as "Disagree" and all other responses were recoded as "Agree."

Cervical Cancer Stigma

Five items from the high-risk HPV-related sexual stigma scale that was developed by Kwan et al. [18] were modified to assess the participant's stigmatizing beliefs about cervical cancer. Items such as "Only promiscuous women get cervical cancer," and "Women with one lifetime partner will not get

cervical cancer,” were aligned with sociocultural beliefs about cervical cancer that were identified in previous studies of Ghanaian women [19, 20]. The response options for the 5-point Likert scale ranged from “Do not agree at all” to “Agree very much.” Prior to the data analysis, the response options were collapsed to “Disagree” and “Agree.”

Analytic Methods

Frequencies and percentages were computed to summarize the demographic data. Chi-square tests for independence and Fisher’s exact test of independence were performed to determine if education level (ranging from “No Formal Education” to “University, Graduate, or Professional School”) was associated with awareness of cervical cancer, cervical cancer screening, and the HPV vaccine, beliefs about cervical cancer screening, and cervical cancer stigma. Statistical significance was set at $\alpha = 0.05$. SAS version 9.4 (SAS Institute, Cary, NC) was used to perform the data analyses.

Ethical Approval

Approval to conduct this study was provided by the Institutional Review Boards at the University of Alabama at Birmingham (UAB) in Birmingham (X150218005), and the Noguchi Memorial Institute for Medical Research in Accra (077/14-15). The scientific protocol was approved by the UAB Comprehensive Cancer Center Protocol Review Committee.

Results

Participant Characteristics

We recruited 298 women to participate in this study; complete surveys were collected from 288 women. A summary of the participants’ characteristics is displayed in Table 1. Our participants ranged in age from 19 to 64 years, with a mean age of 32.4 years. Ten percent of the women in the sample reported having been diagnosed with HIV. Only 10.4% of the participants reported ever having a Pap test. Among the women who had a Pap test, the majority (60%) had completed university, graduate, or professional school. Only five (1.7%) women reported receiving the HPV vaccine.

Awareness of Cervical Cancer, Cervical Cancer Screening, and the HPV Vaccine

Table 2 contains the participants’ responses to questions about their awareness of cervical cancer, cervical cancer screening, and the HPV vaccine. The majority of the women (56.9%) had heard about cervical cancer.

Women with no formal education or who had completed primary school were significantly more likely to report that they had not heard about cervical cancer (< 0.0001). Only 37.5% of the women stated that they had heard about cervical cancer screening. Women who had completed university, graduate, or professional school were significantly more likely to report being aware of cervical cancer screening (< 0.0001). The majority of the women (56.9%) stated that they had heard about the HPV vaccine. Women with no formal education or who had completed primary school were significantly more likely to report that they had not heard about the HPV vaccine (< 0.0001).

Beliefs About Cervical Cancer Screening

The participants’ responses to statements about cervical cancer screening are displayed in Table 3. The majority of participants stated that they did not agree with negative beliefs about cervical cancer screening. There were no significant differences in beliefs about cervical cancer screening between women of different education levels.

Stigmatizing Beliefs About Women with Cervical Cancer

Table 4 contains a summary of the participants’ responses to stigmatizing statements about women with cervical cancer. Ten percent of the participants agreed with the statement “Women with cervical cancer give me a feeling of dirtiness.” Women who completed university, graduate, or professional school were significantly more likely to agree with this statement than women of other education levels (< 0.0001). Nearly 12% of the participants agreed with the statement that “only promiscuous women get cervical cancer.” Women with less than a senior high school education were significantly more likely to agree with this statement than women with higher levels of education ($p = .036$).

Only 9% of the participants agreed with the statement “Women who have had only one sexual partner will not get cervical cancer.” Approximately 18% of the participants agreed with the statement “women are responsible for causing their own cervical cancer.” Only 9% of the participants agreed with the statement “women with cervical cancer are sexually easy.” Ten percent of the participants agreed with the statement “Women with one lifetime partner will not get cervical cancer.” Only 4.2% of participants agreed with the statement “One should keep a social distance from women with cervical cancer.” There were no significant differences in agreement with these statements between women with different levels of education.

Table 1 Demographic characteristics of the participants (*N* = 288)

Characteristic	Overall <i>n</i> (%)	Education level					<i>p</i> value
		No formal education <i>n</i> (%)	Primary school <i>n</i> (%)	Junior high school <i>n</i> (%)	Senior high school <i>n</i> (%)	University, graduate, or professional school <i>n</i> (%)	
Age							< 0.0001
Mean (SD)	32.4 (10)	42.4 (10.1)	36.26 (10.2)	33.4 (10.3)	31.1 (11.3)	29.4 (6.8)	
Marital status							< 0.0001 ^a
Divorced	15 (5.2)	1 (6.3)	5 (18.5)	6 (6.9)	2 (2.9)	1 (1.1)	
Married/partnered	139 (48.3)	8 (50)	16 (59.3)	46 (52.9)	32 (46.4)	37 (41.6)	
Single, not married	120 (41.7)	3 (18.8)	4 (14.8)	28 (32.2)	34 (49.3)	51 (57.3)	
Widowed	13 (4.5)	4 (25)	1 (3.7)	7 (8.0)	1 (1.4)	0	
Other	1 (0.3)	0	1 (3.7)	0	0	0	
Ever had a Pap test							0.0007 ^b
No	257 (89.2)	15 (93.8)	26 (96.3)	84 (96.6)	61 (85.4)	71 (79.8)	
Yes	30 (10.4)	1 (6.3)	0	3 (3.4)	8 (11.6)	18 (20.2)	
Don't know	1 (0.3)	0	1 (3.7)	0	0	0	
Ever received the HPV vaccine							0.26 ^c
No	283 (98.3)	16 (100)	27 (100)	87 (100)	68 (98.60)	85 (95.5)	
Yes	5 (1.7)	0	0	0	1 (1.4)	4 (4.5)	
Diagnosed with HIV							< 0.0001 ^b
No	257 (89.2)	9 (56.3)	24 (88.9)	72 (82.5)	66 (95.7)	86 (96.6)	
Yes	30 (10.4)	7 (43.8)	3 (11.1)	15 (17.2)	3 (4.3)	2 (2.2)	
Don't know	1 (0.3)	0	0	0	0	1 (1.1)	

^a Fischer's exact test of independence performed because 60% of the cells had expected counts less than 5

^b Fischer's exact test of independence performed because 47% of the cells had expected counts less than 5

^c Fischer's exact test of independence performed because 50% of the cells had expected counts less than 5

Table 2 Awareness of cervical cancer, cervical cancer screening, and the HPV vaccine (*N* = 288)

Cervical cancer and prevention strategies	Overall <i>n</i> (%)	Education level					<i>p</i> value
		No formal education <i>n</i> (%)	Primary school <i>n</i> (%)	Junior high school <i>n</i> (%)	Senior high school <i>n</i> (%)	University, graduate, or professional school <i>n</i> (%)	
Ever heard about cervical cancer							< 0.0001
No	124 (43.1)	12 (75)	23 (85.2)	52 (59.8)	28 (40.6)	9 (10.1)	
Yes	164 (56.9)	4 (25)	4 (14.8)	35 (40.2)	41 (59.4)	90 (89.9)	
Ever heard about cervical cancer screening							< 0.0001
No	180 (62.5)	14 (87.5)	27 (100)	70 (80.5)	44 (63.8)	25 (28.1)	
Yes	108 (37.5)	2 (12.5)	0	17 (19.5)	25 (36.2)	64 (71.9)	
Ever heard about the HPV vaccine							< 0.0001
No	124 (43.1)	12 (75)	23 (85.2)	52 (59.8)	28 (40.6)	9 (10.1)	
Yes	164 (56.9)	4 (25)	4 (14.8)	35 (40.2)	41 (59.4)	80 (89.9)	

Table 3 Negative beliefs about cervical cancer screening (*N* = 288)

Negative beliefs about cervical cancer screening	Overall <i>n</i> (%)	Education level					<i>p</i> value
		No formal education <i>n</i> (%)	Primary school <i>n</i> (%)	Junior high school <i>n</i> (%)	Senior high school <i>n</i> (%)	University, graduate, or professional school <i>n</i> (%)	
Too old for a cervical cancer screening							0.77 ^a
Agree	12 (4.2)	0	1 (3.7)	6 (6.9)	2 (2.9)	3 (3.4)	
Do not agree	276 (95.8)	16 (100)	26 (96.3)	81 (93.1)	67 (97.1)	86 (96.6)	
Too embarrassed for a cervical cancer screening							0.97
Agree	18 (6.3)	1 (6.3)	1 (3.7)	5 (5.7)	5 (7.2)	6 (6.7)	
Do not agree	270 (93.8)	15 (93.8)	26 (96.3)	82 (94.3)	64 (92.8)	83 (93.3)	
Do not want to expose myself							0.65
Agree	27 (9.4)	1 (6.3)	2 (7.4)	11 (12.6)	4 (5.8)	9 (10.1)	
Do not agree	261 (90.6)	15 (93.8)	25 (92.6)	76 (87.4)	65 (94.2)	80 (89.9)	
Healthy women do not need a cervical cancer screening							0.14 ^a
Agree	10 (3.5)	1 (6.3)	2 (7.4)	5 (5.7)	1 (1.4)	1 (1.1)	
Do not agree	278 (96.5)	15 (93.8)	25 (92.6)	82 (94.3)	68 (98.6)	88 (98.9)	
Husband/spouse would want me to get a cervical cancer screening							0.59
Agree	246 (85.4)	14 (87.5)	22 (81.5)	71 (81.6)	59 (85.5)	80 (89.9)	
Do not agree	42 (14.6)	2 (12.5)	5 (18.5)	16 (18.4)	10 (14.5)	9 (10.1)	
If I hadn't had sex for age, I would not need a cervical cancer screening							0.21
Agree	21 (7.3)	1 (6.3)	1 (3.7)	6 (6.9)	2 (2.9)	11 (12.4)	
Do not agree	267 (92.7)	15 (93.8)	26 (96.3)	81 (93.1)	67 (97.1)	78 (87.6)	
I do not want to know if I have cervical cancer							0.07 ^a
Agree	14 (4.9)	1 (6.3)	3 (11.1)	1 (1.1)	2 (2.9)	7 (7.9)	
Do not agree	274 (95.1)	15 (93.8)	24 (88.9)	86 (98.9)	67 (97.1)	82 (92.1)	

^a Fischer's exact test of independence performed because 50% of the cells had expected counts less than 5

Discussion

Significant progress has been made toward increasing the accessibility of a variety of tools for cervical cancer prevention and early detection in Ghana. However, Ghanaian women's participation in cervical cancer prevention strategies had remained low. Cancer awareness is extremely important for the promotion of cancer prevention and early detection and treatment [16]. The findings of this study indicate that many Ghanaian women are not aware of cervical cancer, cervical cancer screening, or the HPV vaccine. We found that awareness of these factors was significantly lower among women with less than a high school education. Similar to the finding of Adanu [21], well-educated women in our sample expressed significantly higher levels of awareness about cervical cancer and screening, but low rates of participation in screening. Only 10.4% of the women in our study reported having had a Pap test, which is similar to prior studies that were conducted in Ghana in 2002 and 2006 [21, 22]. Low cervical cancer screening participation rates among the women in

our sample indicates that there is still a significant need to focus efforts on increasing participation in preventive cervical cancer screenings in Ghana.

The results of prior studies indicate that sociocultural barriers, such as negative beliefs about cervical cancer screening and stigmatizing misconceptions about the causes of cervical cancer, prevent some Ghanaian women from seeking preventive screening [19, 20, 23]. The fear of being embarrassed during a cervical cancer screening, not wanting to expose one's self to a male doctor, and not wanting to know one's cancer status, were common psychological barriers identified in previous studies [19, 20]. However, the majority of the women in our study did not agree with negative beliefs about cervical cancer screening. Our findings about cervical cancer screening beliefs are also in contrast to findings of a study of knowledge of cervical cancer screening among women in Elmina, Ghana, in which Ebu and her colleagues found that the majority of women had negative beliefs about the Pap test [23].

Table 4 Stigmatizing beliefs about women with cervical cancer ($N = 288$)

Stigmatizing beliefs about women with cervical cancer	Overall <i>n</i> (%)	Education level					<i>p</i> value
		No formal education <i>n</i> (%)	Primary school <i>n</i> (%)	Junior high school <i>n</i> (%)	Senior high school <i>n</i> (%)	University, graduate, or professional school <i>n</i> (%)	
Only promiscuous women get cervical cancer							0.036
Agree	33 (11.5)	4 (25)	4 (14.8)	15 (17.2)	5 (7.2)	5 (5.6)	
Do not agree	255 (88.5)	12 (75)	23 (85.2)	72 (82.8)	64 (92.8)	84 (94.4)	
Women who have had only one sexual partner will not get cervical cancer							0.07
Agree	26 (9)	4 (25)	4 (14.8)	6 (6.9)	3 (4.3)	9 (10.1)	
Do not agree	262 (91)	12 (75)	23 (85.2)	81 (93.1)	66 (95.7)	80 (89.9)	
Women are responsible for causing their own cervical cancer							0.67
Agree	52 (18.1)	3 (18.8)	4 (14.8)	20 (23)	12 (17.4)	13 (14.6)	
Do not agree	236 (81.9)	13 (81.3)	23 (85.2)	67 (77)	57 (82.6)	76 (85.4)	
Women with cervical cancer are sexually easy							0.9
Agree	26 (9)	2 (12.5)	2 (7.4)	6 (6.9)	7 (10.1)	9 (10.1)	
Do not agree	262 (91)	14 (87.5)	25 (92.6)	81 (93.1)	62 (89.9)	80 (89.9)	
Women with cervical cancer give me a feeling of dirtiness							0.0004
Agree	29 (10.1)	0	2 (7.4)	2 (2.3)	6 (8.7)	19 (21.3)	
Do not agree	259 (89.9)	16 (100)	25 (92.6)	85 (97.7)	63 (91.3)	70 (78.7)	
Women with one lifetime partner will not get cervical cancer							0.62
Agree	29 (10.1)	1 (6.3)	4 (14.8)	10 (11.5)	4 (5.8)	10 (11.2)	
Do not agree	259 (89.9)	15 (93.8)	23 (85.2)	77 (88.5)	65 (94.2)	79 (88.8)	
One should keep a social distance from women with cervical cancer							0.4 ^a
Agree	12 (4.2)	0 (0.0)	2 (7.4)	6 (6.9)	2 (2.9)	2 (2.2)	
Do not agree	276 (95.8)	16 (100)	25 (92.6)	81 (93.1)	67 (97.1)	87 (97.8)	

^a Fischer's exact test of independence performed because 50% of the cells had expected counts less than 5

Previous studies of Ghanaian women have identified stigmatizing misconceptions about the causes of cervical cancer, such as it only affects promiscuous women [19, 20]. At least 10% of our participants agreed with four of the seven stigmatizing statements. This indicates that cervical cancer awareness messages need to address these harmful misconceptions.

The quadrivalent and bivalent HPV vaccines are available in Ghana, although to date, there is no national routine HPV vaccination program [1]. Over half of the women in our sample were aware of the HPV vaccine. Similar to the findings of Colmen and her colleagues [24], HPV vaccine awareness was highest among well-educated women. Although over 50% of our participants were aware of the HPV vaccine was high, uptake of the vaccine was extremely low. Only five women in our study reported having received the HPV vaccine. A demonstration project of the HPV vaccine was initiated by Gavi, the vaccine alliance, in 2013; however, the current status of the project has not been reported [25]. Given the potential cost-effectiveness of the HPV vaccine in reducing the incidence of cervical cancer, our findings suggest that there is a need to increase HPV vaccine coverage in Ghana [26, 27].

With a predicted increase in cervical cancer incidence and mortality rates in Ghana, more strategies are needed to eliminate sociocultural barriers to participation preventive cervical cancer screenings. Our findings indicate that more efforts are needed to increase participation in cervical cancer screening and uptake of the HPV vaccine among women with lower levels of education. In 2016, the net primary school enrollment rate for females was 88.2% [28]. Therefore, providing health promotion intervention about cervical cancer prevention in primary school may help to increase awareness among Ghanaian women.

A strength of our study is that we had a sample of women of diverse educational levels. Previous studies of Ghanaian women's awareness of cervical cancer, cervical cancer screening, and HPV vaccine mostly involved well-educated women [21, 22, 24]. In addition, our sample included women living with HIV. Cervical cancer is an AIDS-related malignancy; therefore, public health practitioners should identify the cervical cancer awareness and prevention behaviors among this high-risk population.

A limitation of our study was the use of a cross-sectional study design. In addition, the survey was only administered in

Accra, a large metropolis. Therefore, the findings may not be representative of all Ghanaian women, especially those living in smaller cities and rural towns. Also, it is unclear whether social desirability bias may have influenced participant responses. Social taboos about discussing women's health issues may have influenced some participants to under-report their actual beliefs about cervical cancer screening and/or stigmatizing beliefs about women with cervical cancer.

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Compliance with Ethical Standards

Approval to conduct this study was provided by the Institutional Review Boards at the University of Alabama at Birmingham (UAB) in Birmingham (X150218005), and the Noguchi Memorial Institute for Medical Research in Accra (077/14-15). The scientific protocol was approved by the UAB Comprehensive Cancer Center Protocol Review Committee.

Conflict of Interest The authors declare that they have no conflict of interest.

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