

ISSN 1596-3519



Volume 16 Issue 1 January - March 2017

[www.annalsafmed.org](http://www.annalsafmed.org)

# Annals of African Medicine

Medknow

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# Knowledge, Attitude, and Experience of Cervical Cancer and Screening among Sub-saharan African Female Students in a UK University

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## Abstract

**Background:** Cervical cancer is one of the major diseases that affect women of child bearing age. Its main cause is the human papilloma virus; although, other associated factors have been evidenced to increase its risk. Pap-smear screening and vaccination which has been shown to be successful in reducing the incidence and prevalence of the disease in developed countries, has been neglected in developing countries due to lack of knowledge, misconceptions, and cultural beliefs. **Materials and Methods:** A cross-sectional study involving only female Sub-Saharan Africa (SSA) students in a UK university setting. **Results:** One hundred and eighty-six (42%) African female students were recruited from the 442 SSA students attending one of the major Universities in the UK. Seventy-one (38.2%) of the students were aware of cervical screening, but only 20 (10.8%) reported having knowledge of cervical cancer. A small percentage of about 26.9% (50 Students) were already part of this screening program; although, 81 (43.5%) showed willingness to participate in future screening programs. More so, it was evident that student's perception was dependent on their experience of the disease ( $P = 000$ ) just as their participation in screening program was dependent on their awareness level ( $P \leq 0.01$ ). **Conclusion:** Female African students from the SSA region have poor knowledge of the disease which influenced their attitude toward screening. More needs to be carried out to increase awareness and uptake of screening within the school environment as university setting provides a viable platform to promote healthy behavior.

**Keywords:** Awareness, cervical cancer, cervical screening, human papilloma virus, Sub-Saharan Africa

## Résumé

**Contexte:** Le cancer du col de l'utérus est l'une des principales maladies qui touchent les femmes en âge de procréer. Sa principale cause est le virus du papillome humain; Bien que, d'autres facteurs associés ont été mis en évidence pour augmenter son risque. Le dépistage du Pap et la vaccination, qui s'est avéré efficace pour réduire l'incidence et la prévalence de la maladie dans les pays développés, a été négligé dans les pays en développement en raison du manque de connaissances, d'idées fausses et de croyances culturelles. **Matériel et Méthodes:** Une étude transversale impliquant seulement des étudiantes d'Afrique subsaharienne (SSA) dans un université britannique. **Résultats:** Cent quatre-vingt-six (42%) étudiantes africaines ont été recrutées parmi les 442 étudiants SSA fréquentant l'une des plus grandes universités du Royaume-Uni. Soixante et onze (38,2%) des étudiants étaient au courant du dépistage du cancer du col, mais seulement 20 (10,8%) ont déclaré avoir une connaissance du cancer du col de l'utérus. Un faible pourcentage d'environ 26,9% (50 étudiants) ont déjà partie de ce programme de dépistage; 81 (43,5%) se sont montrés disposés à participer à de futurs programmes de dépistage. De plus, il était évident que la perception des étudiants dépendait de leur expérience de la maladie ( $P = 000$ ), tout comme leur participation au programme de dépistage dépendait de leur niveau de sensibilisation ( $P \leq 0,01$ ). **Conclusion:** Les étudiantes africaines de la région de l'Afrique subsaharienne connaissent mal la maladie et ont influencé leur attitude envers le dépistage. Davantage de mesures doivent être prises pour accroître la sensibilisation et l'adoption du dépistage dans l'environnement scolaire, car le cadre universitaire constitue une plate-forme viable pour promouvoir un comportement sain.

**Mots-clés:** Sensibilisation, cancer du col utérin, dépistage du cancer du col utérin, virus du papillome humain, Afrique subsaharienne

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**DOI:**  
10.4103/aam.aam\_37\_16

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**How to cite this article:** Ogbonna FS. Knowledge, attitude, and experience of cervical cancer and screening among Sub-saharan African female students in a UK University. Ann Afr Med 2017;16:18-23.

## INTRODUCTION

One in ten women is diagnosed with cervical cancer and every 2 min, a woman dies of it globally, making it the second most commonly diagnosed gynecological cancer.<sup>[1,2]</sup> Highest incidence of cervical cancer related death occurs among middle age women about 30–40 years. Of the 273,505 deaths recorded, 80% occurred in low and middle income countries.<sup>[3]</sup> In Sub-Saharan Africa (SSA), of the 78,897 women diagnosed with cervical cancer annually, 61,671 deaths were recorded which makes the disease one of the most prevailing cancers.<sup>[4]</sup> In Uganda, Mali, Nigeria, and Zimbabwe, cervical cancer is the second most prevailing cancer among women aged 15–44 years.<sup>[5,6]</sup> A major misconception lies in the treatment of cervical cancer which is viewed as the removal and reinsertion of the womb and believed to cause unavoidable death.<sup>[7]</sup> In SSA, cervical cancer is yet to be acknowledged as an important public health problem.<sup>[5]</sup> The low awareness of the disease in Africa which cuts across different literacy levels have been reported.<sup>[8–12]</sup> In Nigeria, only 22 (4.3%) among 500 attendees of a maternal and child health clinic in Lagos were found to be aware of cervical cancer disease. Over 80% of one hundred and thirty-nine patients with advanced cervical cancer said they have never heard of the disease whereas 10%–30% assumed that the symptoms they presented were related to lower genital infection, menstrual cycle, and irregular menses.<sup>[10]</sup> Only 9% of the patients knew the disease was cancer related, a condition needing urgent medical attention.<sup>[5]</sup> Poor awareness of the disease and attribution of symptoms to minor health condition led 98% of patients with advanced invasive cervical cancer to believe that their health problem was incurable.<sup>[5]</sup> Similar findings of poor awareness of cervical cancer and screening among patients have also been reported in Kenya and Tanzania.<sup>[13,14]</sup> Students have been reported to have poor knowledge of cervical cancer and screening, especially in developing countries.<sup>[5,9,15]</sup> In South Africa, the overall knowledge of cervical cancer was very poor among female university students.<sup>[9]</sup> Sexual intercourse before 18 years of age, multiple sex partners and previous history of sexually transmitted diseases (STD) were major risk factors of cervical cancer.<sup>[5]</sup> It is crucial therefore, to promote awareness of the disease among young people. Current global changes in population dynamics, with an increasing middle aged population will result in a 4-fold increase in cervical related mortality,<sup>[3]</sup> which explains the need for immediate public health action to scale up preventive services by creating more awareness and community participation among this population.

## MATERIALS AND METHODS

Ethical approval was obtained from the university's Research Ethics Panel in the Faculty of Medical Sciences. A semi-structured, self-administered questionnaire consisting of four sections with 22 questions was given to 186 SSA female students. The questions were aimed at examining student's knowledge, attitude, perception, and experience of cervical cancer, its risk factors and screening. Students were recruited using two approaches: Online source and convenient

sampling which involved recruitment of participants in open spaces such as study lounges, libraries, and cafeterias. Students who expressed an interest to participate were first given a participant information sheet and a consent form. Self-directed web-linked questionnaire only accessible to the researcher was also generated and sent via E-mails and social media with a covering letter explicitly targeting only SSA female students. SPSS version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp) was used for data analysis. Pearson Chi-square ( $\chi^2$ ), multiple response analysis, bivariate, and multinomial logistic regression analysis were calculated, analyzed, and interpreted.

## RESULTS

One hundred and 86 (42%) SSA female students of 442 African students in one of the university's campus completed the survey. One hundred and 53 (82%) students completed the survey online and the remaining, at university's open spaces. One hundred and five (56.5%) students were between the ages of 18 and 24 with the least percentage of 0.5% (1) between the ages of 31 and 35. About 103 (55.4%) were Nigerians with the rest percentage from Sub-Saharan countries. Black British students were excluded from the study to ensure unbiased information. One hundred and 43 (76.9%) students were currently undergoing a degree while the least percentage 2.7% (5) were currently in the doctorate level (grouped as "others" for statistical reasons). Students number of years in the UK was not explicitly stated in the study. However, it can be deduced from students' level of education; although, this could be difficult to ascertain as some of the students might already be resident in the country as a result of academic progression of which this study did not investigate [Table 1].

### Knowledge of cervical cancer

Table 2 shows poor knowledge of cervical cancer as reported by some of the students. One hundred and twenty-seven (68.3%) had no knowledge of the disease. More so, in respect to age at risk, 74 (39.8%) students agreed that women aged 20–29 (standardized age in UK) are at a higher risk of contracting the disease, whereas forty female students (21.5%) said cervical cancer is unrelated to age. More than half of the students reported not being confident in identifying cervical cancer signs and risk factors [Table 3].

### Knowledge of cervical cancer risk factors

Fifty-one (27.4%) students were certain that infection with human papilloma virus (HPV) was a risk factor of cervical cancer, 99 (53.2%) viewed cigarette smoking as a major factor that fosters carcinogenesis of the cervix, 122 (65.6%) reported weak immune system as a risk factor, and 55 (29.6%) agreed that prolonged use of contraceptive pills can predispose one to cervical cancer. However, about 175 (94.1%) students viewed STD infection as a major risk factor, 47 (25.3%) reported having too many children as a risk factor while 108 (58.1%) affirmed that early marriage/sex below 18 years is a risk factor. One hundred and sixty-two (87.1%) and 114 (61.3%) students,

respectively, affirmed that having multiple sex partners or having a partner with multiple sex partners puts an individual into cervical cancer high risk category, whereas 89 (47.8%) reported none/irregular Pap-smear test as a main factor that encourages cervical cancer.

The above findings were collated using a multiple response analysis to determine the total response of students on cervical cancer risk factors as shown in Table 4. Conclusively, only 102 (54.9%) students had knowledge of the disease risk factors. Table 5 shows the number and percentage of students in relation to their level of knowledge on cervical cancer risk factors. The knowledge score was used to determine the need for increased awareness within the school environment. Seventy-one (38.2%)

students reported being aware of cervical screening services provided in the country. However, a greater percentage of about 45.2% (82 students) said they have no knowledge of the screening programs. It is also evident that 58 (31.2%) students who knew about cervical screening services in the UK reported being informed through social/mass media [Table 6].

**Misconception**

Students were asked “if sex with an uncircumcised partner was a risk factor for cervical cancer based on some cultural misconceptions. This question was asked in other to ascertain the authenticity of some misconceptions about the disease of which there was. About 99 (53.2%) students were not certain about the association of circumcision and cervical cancer [Table 7], whereas 65 (34.9%) students reported sex with uncircumcised partner as a risk factor for cervical cancer.

**Table 1: Characteristics of participants (n=186)**

Students demographic characteristics	Number of students (%)
Age group	
18-24	105 (56.5)
25-30	77 (41.4)
31-35	1 (0.5)
Above 35	3 (1.6)
Nationality	
Nigeria	103 (55.4)
Ugandan	22 (11.8)
Zambian	39 (21.0)
Zimbabwean	2 (1.1)
Ghana	15 (8.1)
Rwandese	1 (0.5)
Kenya	4 (2.2)
Marital status	
Single/never married	169 (90.9)
Married/living with partner	15 (8.1)
Others	2 (1.1)
Level of education	
Degree	143 (76.9)
Masters	38 (20.4)
Others	5 (2.7)
Sexual orientation	
Heterosexual	178 (95.7)
Homosexual	1 (0.5)
Others	7 (3.8)

**Table 2: Knowledge of cancer and cervical cancer (n=186)**

Response	Number of students (%)
Unsure	39 (21.0)
Yes	20 (10.8)
No	127 (68.3)

**Table 3: Level of confidence (n=186)**

Students confidence level	Number of students (%)
Partially confident	79 (42.5)
Not confident	107 (57.5)
Confident	0

**Table 4: Multiple response analysis of student’s knowledge on CCA risk factors**

CCA risk factors	Number of students (%)
Unsure	491 (26.4)
Yes	1022 (54.9)
No	347 (18.7)
Total	1860 (100)

CCA=Cervical cancer

**Table 5: Student’s CCA risk factor knowledge score**

Knowledge level	Knowledge score	Number of students (%)
High knowledge	8-10	60 (32.3)
Moderate knowledge	5-7	84 (45.2)
Low knowledge	3-4	25 (13.4)
Poor knowledge	0-2	17 (9.1)

**Table 6: Awareness of NHS CCA screening services based on student’s age**

Age group	Are you aware of the NHS CCA screening services?			
	Yes	No	Unsure	Total
18-24	52	33	20	105
25-30	16	50	11	77
31-35	1	0	0	1
Above 35	2	1	0	3
Total number and percentage of students	71 (38.2)	84 (45.2)	31 (16.6)	186 (100)

CCA=Cervical cancer, NHS=National Health Service

**Table 7: Is sex with an uncircumcised partner a risk factor for CCA?**

Responses	Number of students (%)
Unsure	99 (53.2)
Yes	65 (34.9)
No	22 (11.8)

### Experience of students on cervical cancer

Most of the participants had no prior experience of cervical cancer as reported by 127 (68.3%) students [Table 8]. Experience of cervical cancer in this study refers to student's personal experience or knowledge of someone who has been exposed to cervical cancer disease.

### Perception of cervical cancer and attitude to screening programs

Seventy-seven (41.4%) students perceived cervical cancer to be a deadly disease which needs urgent attention, whereas others emphasized on the need for more awareness on screening services. Nevertheless, 109 (58.6%) students had a negative perception which viewed cervical cancer as a forbidden disease based on cultural differences [Table 9].

From the multinomial logistic regression analysis, it was ascertained that students who are unsure of their experience of cervical cancer compared to students who have no prior experience of the disease, are less likely to have a positive perception (odds ratio [OR] = <0.088). However, students with prior experience of cervical cancer compared to students with no prior experience, were more likely to have a positive perception (OR = >1.5). Therefore, it can be denoted that the maximum likelihood ratio ( $P = 0.000$ ) of student's perception of cervical cancer was dependent on their experience of the disease.

### Stigmatization

More than half of the students, 97 (52.2%) reported not being comfortable in associating with cervical cancer victims [Table 10].

### Decision to participate in screening

A small percentage of the students, 50 (26.9%) were already part of a screening program although 81 (43.5%) of the students declared their willingness to participate in screening activities [Table 11].

Analysis suggests a significant co-relation between student's decision to participate in screening and perception of the disease ( $P = 0.000$ ). A negative association was hypothesized between the variables. However, since the Pearson correlation value is 0.652 and is significant, the findings did not support the study hypothesis [Table 12].

It was observed that 79 (42.5%) students that have been informed of cervical cancer (CCA), plan to participate in screening programs. Similarly, 38 (20.4%) students who were also informed refused participation, whereas 69 (37.1%) were already part of a screening program. Pearson  $\chi^2$  showed a statistical significance of  $P \leq 0.01$  which means that the level of participation is dependent on the level of awareness. Some of the reasons students gave for nonattendance is represented in Table 13 of which 135 (72.6%) students had no reason for not participating in screening activities.

### Help seeking and attitude toward uptake of screening

It was also noted that a high percentage of the students, 106 (57.0%) students were willing to contact their general

**Table 8: Have you or your family/friends had CCA?**

Responses	Number of students (%)
Unsure	39 (21.0)
Yes	20 (10.8)
No	127 (68.3)
Total	186 (100)

**Table 9: What is your perception of CCA?**

Responses	Frequency (%)
A deadly disease	77 (41.4)
A forbidden disease	109 (58.6)

**Table 10: Would you comfortably associate with someone who has CCA?**

Responses	Number of students (%)
Yes	89 (47.8)
No	97 (52.2)
Total	186 (100)

**Table 11: Willingness to participate in CCA screening program**

Responses	Number of students (%)
Yes	81 (43.5)
No	55 (29.6)
Already part of the program	50 (26.9)
Total	186 (100)

**Table 12: Co-relation (bivariate analysis)**

	Do you plan to participate in the CCA screening program?	What is your perception of CCA?
Do you plan to participate in the CCA screening program?		
Pearson correlation	1	0.652**
Significant (two-tailed)		0.000
n	186	186
What is your perception of CCA?		
Pearson correlation	0.652**	1
Significant (two-tailed)	0.000	
n	186	186

\*\*Correlation is significant at the 0.01 level (two-tailed). CCA=Cervical cancer

practitioner (GP) immediately they notice any sign of cervical cancer [Table 14].

## DISCUSSION

From the analysis of the knowledge score, it was deduced that SSA female students have poor knowledge of cervical cancer as only 20 (10.8%) students were recorded to have knowledge of

**Table 13: Reasons for nonattendance**

Reasons	Number of students (%)
I don't have time for it	21 (11.3)
The reception/GP hours are not suitable for me	11 (5.9)
I am afraid the test will come out positive	5 (2.7)
I don't think it is necessary	14 (7.5)
Not applicable	135 (72.6)
Total	186 (100)

GP=General practitioner

**Table 14: How soon would you contact your GP if you notice a symptom?**

Responses	Number of students (%)
Immediately	106 (57.0)
Wait for other symptoms	44 (23.7)
Never	36 (19.4)
Total	186 (100)

GP=General practitioner

the disease. This supports the findings from the previous study conducted in Africa which showed poor knowledge of cervical cancer and its risk factors among students.<sup>[16]</sup> More so, student's level of confidence in identifying cervical cancer risk factors was low as only 42.5% (79) reported being partially confident while others were not confident at all which remains an issue for concern. This implies that the need to create more awareness within the school environment cannot be over-emphasized. Some of the key factors of cervical cancer identified by students based on multiple response analysis were, HPV infection, smoking, weakened immune system, early teenage marriage, having many children (multi-gravid), vaginal bleeding, lower back pain, painful urination, and dyspareunia. These findings have been supported and evidenced by some studies to be the main key risk factors and warning signs of cervical cancer; although, it has also been noted that the presence of one or two signs does not guarantee that the individual has cervical cancer except diagnostically proven,<sup>[17-19]</sup> which supports why some of the students reported waiting for other symptoms before consulting their GP.

Cross tab analysis suggests that knowledge of cervical cancer risk factors influenced student's decision to participate in screening services. This was evidenced in some studies which showed that increase in acceptance and implementation of screening practices was made successful through awareness.<sup>[20,21]</sup> However, only 71 (38.2%) students were aware of the National Health Service (NHS) cervical screening services irrespective of the awareness and screening services made available to the public. A study done in Africa however, revealed the failure of screening services,<sup>[22]</sup> which could have contributed to student's lack of interest.

This study findings also suggest that students' perception of cervical cancer influenced their association with cervical cancer diagnosed victims. About 109 (58.6%) students who

had a negative perception of the disease refused association with cervical cancer victims of which majority viewed it as a forbidden sickness. A significant relationship was also found between student's perception of the disease and participation to screening which could thus, may have affected GP's consultation too. Findings from previous studies have deemed this to be a cultural thing based on misconceptions as most African culture forbids the woman of mentioning her reproductive organ to anyone, especially male health practitioners.<sup>[5,6]</sup> Some of the reasons for nonattendance to cervical screening included lack of knowledge of Pap-smear test, fear of unknown result outcome, and lack of interest in screening.<sup>[23]</sup>

The multinomial logistic regression analysis showed that both students with positive and negative perception of the disease were directly or indirectly influenced by their past experience. Peoples' experience affect them not only financially but intellectually and psychologically which in turn affects their perception of the disease.<sup>[24]</sup>

## CONCLUSION

The high rate of cervical cancer and screening awareness in the United Kingdom cannot be compared to countries in the SSA region therefore, it is expected that the level of information available will influence students originating from these African countries. It has been noted from this study that students have poor knowledge of the disease because they are yet to understand how vulnerable they are which explains the urgent need to enlighten students on the severity of the disease and encourage them to take up screening programs irrespective of their experience and perception. This will help decrease the trend of the disease both at the national and global level. The use of health education programs and lectures that incorporate cervical cancer and screening messages could be inculcated as part of the school curriculum and offered to all students regardless of their health status or denomination. The use of mini surveys to understand student's knowledge on the disease and screening services will help improve the school GP's screening services. Large scale studies' exploring the uptake of screening services among all female students irrespective of their race or nationality is highly recommended.

## Acknowledgment

Special thanks to my supervisor who took her time to ensure that this project measures up to standard. My heartfelt gratitude goes to all my lecturers, colleagues, and fellow students who contributed to ensure this project was a success.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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