

The Influence of Health Literacy on Knowledge of Cervical Cancer Prevention and Screening Practices among Female Undergraduates at a University in Southwest Nigeria

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Abstract

The global incidence of cancer is rising, and low-income and lower-middle-income countries have the worst figures. However, knowledge of cervical cancer prevention and cervical cancer screening practices remains poor in these regions. This study assessed the concept of health literacy as a potential determinant of knowledge of cervical cancer prevention and screening practices among female undergraduates. A descriptive cross-sectional study was conducted among 385 female undergraduates at a university in southwest Nigeria. A validated questionnaire composed of subscales on nine components of health literacy, knowledge of cervical cancer prevention, and cervical cancer screening practices was used for data collection. The majority of the respondents obtained a high score on most of the components of health literacy and 66% had good knowledge of cervical cancer prevention. Only 11% demonstrated good practices of Pap smear testing. Of all the components of health literacy, “feeling understood and supported by healthcare providers” (OR = 0.075; 95% CI [0.036–0.115]; $p = 0.015$) and “understanding health information well enough to know what to do” (OR = 0.055; 95% CI [0.006–0.104]; $p = 0.029$) were significantly associated with knowledge of cervical cancer prevention. Out of the major challenges related to cervical cancer screening among undergraduates, the feeling of being at risk (OR = 4.71; $p < 0.05$) and uncomfortable experiences from past screening (OR = 0.12; $p < 0.05$) were significantly associated with

going for cervical cancer screening. The study concluded that levels of health literacy influenced knowledge of cervical cancer prevention among female undergraduates, but it did not affect their engagement in cervical cancer screening practices.

Keywords: cancer screening; cervical cancer; cervical cancer prevention; health literacy; Pap smear test

Introduction and Background Information

Cancer remains a menace to the human population. According to the Global Cancer Observatory (GLOBOCAN), an international agency for research on cancer, in 2018 there were 18.1 million new cancer cases and 9.6 million cancer deaths globally; furthermore, cervical cancer ranked fourth among the most frequently diagnosed cancers and was the leading cause of cancer death among females (Bray et al. 2018, 395). The burden of cancer is growing in low-income and lower-middle-income countries due to poor economic development and the associated social and lifestyle factors. The prognosis of cancer tends to be poorer in these regions, primarily as a result of challenges regarding the prevention, early detection, diagnosis, treatment, and palliation of cancer (Vanita et al. 2011, 1214).

Cervical cancer is sex-specific and there are striking disparities in the global cancer burden in women; however, the cancer burden worldwide seems to be on the increase. Cervical cancer was estimated to have caused 266 000 deaths globally in 2012, accounting for 7.5% of all female cancer deaths (Cheikh et al. 2016). Cervical cancer is becoming a leading cause of death among women in low-income and lower-middle-income countries, claiming more lives than other types of cancer per annum in these regions (Binka, Nyarko, and Doku 2016, 323). Cervical cancer was also the most common cancer in women in Eastern and Central Africa in 2014 (WHO 2014, 26). According to the Centers for Disease Control and Prevention (CDC) (2019), long-lasting infection with certain types of human papillomavirus (HPV) is the main cause of cervical cancer, and all women are at risk for this disease, especially women over the age of 30. The CDC posits that at least half of sexually active people will have HPV at some point in their lives, but few women will get cervical cancer. HPV-related cancers often take years to develop after an HPV infection. The development of abnormal cells on the cervix and the development of cervical cancer after an initial HPV infection can take ten or more years (WHO 2014).

According to the CDC (2019), cervical cancer is highly preventable, and most Western countries have achieved a decline in cervical cancer rates because screening tests and a vaccine to prevent HPV infections are available. However, because the vaccine does not protect against all HPV types that can cause cervical cancer, girls vaccinated against HPV will still require cervical cancer screening later in their lives (WHO 2014, 5). Pap smears are widely accepted as the model screening test for cervical cancer. The CDC

(2019) recommended that women start going for Pap smear tests at age 21. The organisation explained that early detection, by screening all women in the target age group of 21–29 years of age and 30–65 years every three years, followed by the treatment of any detected precancerous lesions, can prevent the majority of cervical cancers. Cancer cases worldwide could be reduced significantly by using existing knowledge of cancer control; programmes on vaccination; control on tobacco use; early diagnosis and treatment; and health campaigns to increase awareness of physical activity and the consumption of a healthy diet (Jemal et al. 2011, 69; Torre et al. 2017, 453).

The Healthy People 2010 database of the CDC defines health literacy as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (United States 2008). Health literacy is more than the mere ability to read and write; it requires an array of interrelated skills—namely reading, listening, analysing and making decisions—and the ability to apply these skills to health situations. Inadequate health literacy has been identified as one of the major barriers to functional health literacy (Malik, Khan, and Hussain 2017, 15209). Studies have shown that adolescents and young adults have higher levels of health literacy compared to older adults, but almost half still possess limited knowledge of disease prevention (Berens et al. 2016, 4). Building health literacy levels, as well as improving the knowledge and capacity of adolescents and young adults to prevent diseases, is crucial to better target public health interventions for cervical cancer prevention and screening practices for adolescents and young adults.

Research Problem

According to a recent estimate by the World Health Organization (WHO), cervical cancer is the fourth most frequent cancer in women, with 570 000 new cases in 2018 (WHO 2019). Cervical cancer is becoming a leading cause of death among women in low-income and lower-middle-income countries, claiming more than 265 000 lives per annum in these regions (Binka, Nyarko, and Doku 2016, 323). According to the WHO, cervical cancer will kill more than 443 000 women per year worldwide by 2030, of which 90% will be in sub-Saharan Africa (Ralph-Sydney et al. 2017, 613). In Nigeria, the estimated incidence and mortality rate of cervical cancer in 2018 was 36 per 100 000 and 17.5 per 100 000, respectively (Akinfenwa and Monsur 2018, 26). In Africa, there is extensive knowledge about cervical cancer prevention, treatment, and palliative care; however, treatment facilities are inadequate as a result of economic, structural, logistical, and transport difficulties in the region (WHO 2012).

Health literacy has emerged globally as a potential determinant of uptake of cervical cancer screening practices and possession of preventative knowledge (Kim and Han 2016, 122). However, health literacy has been overlooked as a factor that influences knowledge of cervical cancer screening practices among female undergraduates.

Inadequate health literacy is one of the major barriers to functional health literacy, and people who have limited health literacy are reportedly unable to adhere to standardised instructions (Malik, Khan, and Hussain 2017, 15209). People with low health literacy are reportedly less knowledgeable about diseases, face high mortality rates (Hickey et al. 2018, 49), have poorer self-management behaviour, and represent increased costs to health services (Mackey et al. 2016, 741). Furthermore, the high level of education among undergraduates does not necessarily imply good knowledge of cancer prevention and uptake of cervical cancer screening services.

It may not be sufficient to use education as a measure to increase literacy of health practices for cancer screening. Studies have shown that literacy can act as its own predictor of health issues, even in the presence of other variables such as race, education, culture, and income (Abel et al. 2014, 725). There is limited literature investigating how different components of health literacy influence knowledge of cervical cancer prevention and screening practices among female undergraduates—hence the need for this study.

Purpose and Objectives of the Study

The purpose of this study was to assess the influence of health literacy on knowledge of cervical cancer prevention and screening practices among female undergraduates. The specific objectives were to assess:

- levels of health literacy among female undergraduates
- levels of knowledge of cervical cancer prevention among female undergraduates
- cervical cancer screening practices among female undergraduates
- barriers to cervical cancer screening
- the influence of health literacy on knowledge of cervical cancer prevention among female undergraduates
- the influence of health literacy on cervical cancer screening practices among the study population.

Research Methods and Design

The study used a descriptive cross-sectional survey design. Quantitative data were collected from female undergraduates at Obafemi Awolowo University, Nigeria, with the aid of a self-administered questionnaire.

Research Setting

The study was conducted at Obafemi Awolowo University, located in the suburban setting of Ile-Ife in the southwest of Nigeria. Obafemi Awolowo University is one of

the foremost federal universities. It was founded in 1961 and currently has a full-time student population of about 35 000.

Research Population and Sample

The study population comprised female undergraduates at Obafemi Awolowo University, Nigeria. Potential respondents were proportionately selected across all faculties and selected departments in the institution. This was done by dividing the number of students in each selected department by the total number of students in all selected departments and then multiplying this figure by the calculated sample size. The calculated sample size for this study was 418 (including a 10% non-response rate). However, only 385 respondents correctly completed the questionnaire; they thus formed the final sample for the study.

Data Collection Instrument

Data were collected using a structured questionnaire with standardised questions for the measurement of health literacy, knowledge of cervical cancer prevention, and engagement in screening practices. The instrument consisted of five sections:

- Section A assessed the background characteristics of the respondents, such as age, faculty, department, level, religious affiliation, and marital status.
- Section B assessed the level of health literacy among the respondents. The Health Literacy Questionnaire (HLQ) was adopted for this section. The HLQ explores health literacy through nine conceptually distinct scales and identifies the specific health literacy strengths and limitations of people and communities. It is composed of forty-four items measuring nine scales, comprising four to six items each. Questions 1 to 5 were scored on a 4-point Likert-type response scale (strongly disagree, disagree, agree, and strongly agree) and questions 6 to 9 were scored on a 5-point Likert-type response scale (always difficult, usually difficult, sometimes difficult, usually easy, and always easy). Questions 7 to 10 measure “feeling understood and supported by healthcare providers”, questions 11 to 14 measure “having sufficient information to manage health”, questions 15 to 19 measure “actively managing health”, questions 20 to 24 measure “social support for health”, questions 25 to 29 measure “appraisal of health information”, questions 30 to 34 measure “ability to actively engage with healthcare providers”, questions 35 to 40 measure “navigating the healthcare system”, questions 41 to 45 measure “ability to find good health information”, and questions 46 to 50 measure “understanding health information well enough to know what to do”.
- Section C assessed the level of knowledge of cervical cancer prevention. It consisted of ten questions, with item 55 phrased in the negative. The responses were scored as “Yes” (2) and “No” (1). The maximum and minimum obtainable scores were 20 and 10 respectively. The overall average score was computed and individual

respondents' total scores were categorised as indicative of "good knowledge" and "poor knowledge".

- Section D assessed screening practices engaged in by the respondents. It consisted of eight questions.
- Section E assessed the barriers to cervical cancer screening among the respondents.

Validity and Reliability of the Instrument

Validity was ensured through face and content validity. The items of the final instrument were tested for internal consistency. The subscale for health literacy yielded a Cronbach's alpha value of 0.8, the subscale for cervical cancer screening practice yielded a Cronbach's alpha value of 0.5, and the level of knowledge subscale yielded a Cronbach's alpha value of 0.5.

Data Collection

A total of 418 structured questionnaires were distributed to female undergraduates in all thirteen faculties of the institution. To obtain accurate and more representative data, respondents were selected from all levels in the selected departments of each faculty, according to the calculated sample size. All female hostels and faculties were visited twice in order to hand out and retrieve the questionnaires. Data collection spanned six weeks and 385 completed questionnaires were returned.

Data Analysis

Data analysis was done using the IBM statistical package for the social sciences (SPSS). The first objective was analysed using a descriptive test (percentage, mean, and frequency), which is a univariate level of analysis. For the second objective, the HLQ does not provide one overall summative score; rather, it gives nine separate scores that indicate a person's strengths and needs in relation to health literacy. The third objective was analysed using a descriptive test (cross-tabulation), a bivariate level of analysis. The fourth, fifth, and sixth objectives were analysed using an inferential test (multiple linear regression), which is a multivariate level of analysis.

Ethical Considerations

The study was approved by the Health Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University (HREC no. IPH/OAU/12/1271). A license to adopt the HLQ was also obtained from Deakin University, USA. The study participants were adequately informed of the nature of the study. Their right to participate or withdraw anytime they wished was ensured and their written informed consent was obtained. Anonymity of person and confidentiality of information were maintained.

Analysis and Discussion of Research Results

Female students aged between 19 and 22 years dominated this study, representing about 65% of the total sample (n = 244). The average age was 20.5 years. The majority of the students in this study (81%; n = 312) practised Christianity, and the remainder (19%; n = 73) practised Islam. Also, 97% (n = 374) of the students were single.

Levels of Health Literacy

With regards to levels of health literacy (Table 1), 72.7% (n = 280) felt understood and supported by healthcare providers, 77.9% (n = 300) had sufficient information to manage their health, 86.8% (n = 334) were actively managing their health, 87% (n = 335) received good social support for health, and 84.9% (n = 327) demonstrated good appraisal of health information. In the same way, the majority (83.9%; n = 323) of the respondents reported that it was easy for them to actively engage with healthcare providers, 84.9% (n = 327) found it easy to navigate the healthcare system, 91.4% (n = 352) had the ability to find good health information, and 88.1% (n = 339) understood health information well enough to know what to do. These findings support the study of Berens et al. (2016), which revealed that adolescents and young adults have higher levels of perceived health literacy compared to older adults.

Table 1: Level of health literacy (N = 385)

Health literacy components	Descriptor	%	f
Feeling understood and supported by healthcare providers	Poor	27.3	105
	Good	72.7	280
Having sufficient information to manage my health	Poor	22.1	85
	Good	77.9	300
Actively managing my health	Poor	13.2	51
	Good	86.8	334
Social support for health	Poor	13.0	50
	Good	87.0	335
Appraisal of health information	Poor	15.1	58
	Good	84.9	327
Ability to actively engage with healthcare providers	Difficult	16.1	62
	Easy	83.9	323
Navigating the healthcare system	Difficult	15.1	58
	Easy	84.9	327
Ability to find good health information	Difficult	8.6	33
	Easy	91.4	352
Understand health information well enough to know what to do	Difficult	11.9	46
	Easy	88.1	339

Level of Knowledge of Cervical Cancer Prevention

Findings on the knowledge of cervical cancer prevention showed that 73.5% (n = 283) of the respondents reported that cervical cancer is preventable and 72.2% (n = 278) were aware that a Pap smear test is a preventive gynaecological test for cervical cancer. The majority of the respondents (79.5%; n = 306) agreed that HPV vaccination induces immunity to HPV. However, 61.6% (n = 237) of the respondents did not know that the use of a condom during sexual intercourse can prevent cervical cancer. Table 2 summarises the overall level of knowledge of cervical cancer prevention among the respondents. These findings support the work by Siddharthar, Rajkumar, and Deivasigamani (2014, 2) and by Pandey and Karmacharya (2017), who emphasised that a higher level of education and occupation have a significant impact on knowledge of cancer screening.

Table 2: Level of knowledge of cervical cancer prevention

Overall knowledge of cervical cancer prevention	%	f
Poor	34.0	131
Good	66.0	254
Total	100.0	385

Pattern of Cervical Cancer Screening Practices

According to the responses given by respondents, only 13% (n = 50) of the sampled respondents had ever had a Pap smear test. Of these, 12% (n = 6) have the test every two years, 20% (n = 10) have the test every four years, 4% (n = 2) have the test every three years, and 64% (n = 32) noted that they do so irregularly. A high percentage (70%; n = 35) of the students who have had Pap smear tests for cervical cancer screening confirmed that they did so because of recommendations from their doctors, while 26% (n = 13) did the test as part of a general screening programme. In relation to future test uptake, only 36% (n = 137) of the sampled respondents have plans to have another Pap smear test. These findings, however, contrast with the findings of Siddharthar, Rajkumar, and Deivasigamani (2014, 2), who emphasised knowledge and awareness of the prevention of cervical cancer among women as key factors determining utilisation of screening services.

Barriers to Cervical Cancer Screening Practices

The findings of the study revealed that 88% (n = 329) of the students identified limited information about cervical cancer on university campus as a barrier to screening, while 77% (n = 279) noted the non-availability of screening centres on campus as a barrier to screening. Ironically, about 67% (n = 247) claimed that they had no idea what the test was about. Also, 40% (n = 129) and 49% (n = 157) of the students felt that a Pap smear

test is painful and embarrassing, respectively. In addition 60% (n = 206) of the students felt they are not at risk of cervical cancer, and 55% (n = 188) reported they are not sexually active and thus do not need the screening. Half the sample (50%; n = 172) cited fear of cancer diagnosis and treatment, while 41% (n = 135) of the respondents reported previous uncomfortable vaginal examination experiences as barriers to cervical cancer screening.

Of all the potential barriers considered, the feeling of being at risk of cervical cancer and previous uncomfortable vaginal examination experiences were significantly associated with going for cervical cancer screening tests. For instance, compared to respondents who feel they are not at risk, students who feel they are at risk of cervical cancer have four times greater odds of going for screening (OR = 4.71; $p < 0.05$). On the other hand, respondents whose past experiences with vaginal examinations make them uncomfortable have an 88% reduced chance of going for the screening (OR = 0.12; $p < 0.05$). This is similar to the study of McFarland, Gueldner, and Mogobe, (2016, 491), who emphasised that the common barriers that women encountered were lack of knowledge and awareness about Pap smear screening, and the belief of not being at risk for cervical cancer. Previous uncomfortable vaginal examination experiences were also a major barrier to screening, which is in line with the study of Julinawati et al. (2013, 677), which posits that discomfort during the screening process is a barrier to cervical cancer screening practices.

The Influence of Health Literacy on Knowledge of Cervical Cancer Prevention

Of the nine components of health literacy (Table 3), only “feeling understood and supported by healthcare providers” and “understanding health information well enough to know what to do” were significantly associated with knowledge of cervical cancer prevention. This means that students who have good health literacy also have good knowledge of cervical cancer prevention. This affirms the findings of Lindau et al. (2002, 938), who emphasised poor health literacy as a better predictor of cervical cancer screening knowledge than education.

The Influence of Health Literacy on Cervical Cancer Screening Practices

Out of the nine components of health literacy (Table 3), “actively managing my health”, “social support for health”, “appraisal of health information”, “ability to actively engage with healthcare providers”, and “understanding health information well enough to know what to do” had statistically significant associations with cervical cancer prevention practices. According to Kim and Han (2016, 122), health literacy has emerged as a potential determinant of cervical cancer screening; however, this study reveals that good health literacy does not directly determine good cervical cancer screening practices.

Table 3: The influence of health literacy on knowledge of cervical cancer prevention and cervical cancer screening practices

Observations = 385; F(9, 375) = 3.15 Prob > F = 0.001; Adj R-squared = 0.048				
Knowledge of cervical cancer prevention	Coefficient	P>t	[95% Conf. Interval]	
Feeling understood and supported by healthcare providers	0.075	0.015	0.036	0.115
Having sufficient information to manage my health	0.066	0.089	-0.010	0.142
Actively managing my health	-0.042	0.248	-0.112	0.029
Social support for health	0.049	0.157	-0.019	0.118
Appraisal of health information	0.013	0.709	-0.055	0.081
Ability to actively engage with healthcare providers	0.021	0.396	-0.028	0.071
Navigating the healthcare system	-0.002	0.918	-0.048	0.043
Ability to find good health information	0.018	0.484	-0.032	0.068
Understand health information well enough to know what to do	0.055	0.029	0.006	0.104
Observations = 385, F(9, 375) = 6.48 Prob>F = 0.000, Adj R-squared = 0.114				
Cervical cancer screening practices	Coefficient	P>t	[95% Conf. Interval]	
Feeling understood and supported by healthcare providers	-0.020	0.501	-0.078	0.038
Having sufficient information to manage my health	-0.012	0.745	-0.085	0.061
Actively managing my health	0.062	0.045	-0.006	0.130
Social support for health	-0.106	0.002	-0.172	-0.040
Appraisal of health information	0.059	0.038	-0.007	0.124
Ability to actively engage with healthcare providers	-0.062	0.012	-0.109	-0.014
Navigating the healthcare system	0.030	0.179	-0.014	0.073
Ability to find good health information	0.025	0.301	-0.023	0.073
Understand health information well enough to know what to do	-0.086	0.000	-0.133	-0.039

Conclusions

The study concluded that levels of health literacy have an influence on knowledge of cervical cancer prevention, but not on engagement in cervical cancer screening practices among female undergraduates. Clearly, while being educated and knowledgeable about cervical cancer and cervical screening does not necessarily translate to good cervical health practices, it is evident that most women depend on healthcare providers to take positive action regarding their cervical health. In spite of high levels of health literacy, the lack of cervical screening facilities denies women the opportunity to access timely prevention (Pap smear tests) and treatment for cervical cancer. Precancerous cervical lesions take several years to progress to the aggressive malignant stage; efforts to improve cervical health practices for women should therefore focus on providing the facilities that will enable the millions of female undergraduates to access timely prevention and treatment for cervical cancer.

Recommendations

Screening sites for cervical cancer should be made available on campuses to provide easy access for students. Information on cervical cancer should be disseminated on campuses in order to inform students about the availability of the screening centres and the available services. The Ministry of Health should partner with non-governmental organisations and student associations in order to build the capacity of undergraduates to actively participate in cancer prevention and screening services.

Limitations of the Study

Recall bias is a major limitation in this study. Since the study is self-reporting, there might be differences in the accuracy of the recollections, which can influence the quality of the study. The study is also limited by its sample size, which will affect the generalisability of the findings. Therefore, a wider prospective implementation should be carried out.

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