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RESEARCH ARTICLE

CERVICAL CANCER AWARENESS, SCREENING AND VACCINATION AMONG FEMALE NURSING STUDENTS OF UNIVERSITY OF GHANA

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Abstract

Background: Cervical cancer is a major cause of morbidity and mortality in developing countries despite been largely preventable. Late detection as a result of lack of awareness and access to care including non-availability of comprehensive care centres, lack of mass screening programs compounded by financial constraints, continue to keep the numbers high. This study looked at the level of awareness and practices of female nursing students of University of Ghana on cervical cancer, screening and vaccination.

Methods: This was a descriptive cross-sectional study among 258 female nursing students of University of Ghana using self-administered questionnaire via Google forms. Besides sociodemographic data, general and specific knowledge on cervical cancer as well as screening and vaccination uptake data was collected. Results analysed with SPSS version 26. Means and standard deviations were used for continuous data and chi square for categorical data. A p-value of less than or equal to 0.05 was considered as statistically significant.

Results: The knowledge level was fair among 73.6% of the respondents. The prevalence rate of cervical cancer screening and HPV vaccination was 19.0% and 6.2% respectively. Common reasons given for non-screening and non-vaccination were limited information on cervical cancer including unawareness of vaccine, not being sexually active and high cost of vaccine. There was significant association between screening uptake and vaccination uptake, though no association between knowledge and both screening and vaccination uptake.

Conclusion: The knowledge level on cervical cancer was fair among female nursing students, however the prevalence of screening and vaccination were very low.

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Introduction:-

Cervical cancer causes enormous morbidity and mortality, particularly in developing countries and is therefore a global public health concern. (Ali et al., 2012). It is ranked fourth in the list of common cancers in women globally (Wang et al., 2020b). With the causative agent being the Human Papilloma Virus (HPV), the disease has been found

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to be mainly transmitted sexually, and 84% of HPV-related cancer lesions are cervical cancer (Wang et al., 2020a). Age-standardized incidence and mortality from cervical cancer in Ghana is high at 32.9 and 23.0 per 100,000 respectively (Ampofo, 2020) and recent studies have revealed that it is one of the most predominant cancers affecting women in Ghana (Nartey et al., 2017). Lack of health insurance coverage in screening programs, inadequate knowledge, insufficient funding and high cost of vaccination impede successful coverage of wider areas when it comes to screening and vaccination (Drokow et al, 2020). These and other factors culminating in varied rates of acceptability of vaccination voluntarily have markedly affected effective prevention of the disease (Maharajan et al., 2015). Cancer diagnosis at a terminal-stage, like many other diseases is thus associated with reduced survival rates in spite of clinical interventions like chemotherapy, radiotherapy and surgery. Cervical cancer screening uptake among Ghanaian women is low (Ayanore et al., 2020) and yet the prevention of cervical cancer is based on early diagnosis as well as treatment of the precancerous lesion (Calys-Tagoe et al, 2020).

The major barriers to cervical cancer screening revealed by Fentie et al, 2020, were lack of awareness, religious/cultural beliefs and fear of the screening procedures. Female nursing students in the universities are from different cultural and social backgrounds and are directly involved in health information seeking and dissemination. Therefore, assessing their awareness and prevention practices would be useful in understanding and projecting the challenges relating to cervical cancer prevention and treatment, hence this study

Methods:-

This was a descriptive cross-sectional study of female nursing students at the University of Ghana, Legon campus using self-administered questionnaire. Using the Cochran's formula $N = Z^2 \times p \times q / d^2$ and a prevalence of good knowledge on cervical cancer among female nursing students in Saudi Arabia ((Eittah et al., 2020) with 10% for inconsistencies and non-response, the calculated minimum sample size was 255. A total 258 questionnaires were administered. 258 female nurses were selected conveniently. A link to the online questionnaire was sent to the social media pages of the various year groups for volunteering participants to fill. Consent forms were sent to the respondents. Consented participants were given self-administered questionnaire the English language via Google forms. The questionnaire had sections A to F. Section A elicited demographic data of the respondents. Sections B, C, D, E and F assessed knowledge on cervical cancer, cervical cancer screening uptake, cervical cancer vaccination uptake, barriers to cervical cancer screening and barriers to cervical cancer vaccination respectively. Questions from section B included both actual points on cervical cancer and random points to eliminate guess work. The respondents were required to select the appropriate responses and as many responses as applied to them. The section had six questions with a total of 23 responses. Hence for that section, a respondent was deemed to have good knowledge on cervical cancer if she had 16-23 correct answers. Fair knowledge meant 8-15 correct answers and poor knowledge meant 0-7 correct answers. Respondents used about 5 minutes to fill the questionnaire. The questionnaire was pre-tested and modified on 10 randomly selected students from Family Health Medical School in Accra.

Microsoft Excel 2016 and SPSS (26) was used for data collection and analysis. The means and standard deviations were calculated for continuous variables and chi square used for categorical data, and results presented as texts, tables and charts.

Ethical approval was given by Community Health Dissertation Review Committee, University of Ghana Medical School (UGMS) before data collection.

Results:-

Selected demographic characteristics of respondents:

The survey consisted of 258 respondents within the age range of 17 - 42 years and a mean of 22.62(±4.45 years). Most (241(93.4%)) of the participants were Christians. Majority (98(38.0%)) from level 300, followed by 64(24.8%) and 40(15.5%) from levels 200 and 100 respectively and most 228(88.4%), were single.

Knowledge of cervical cancer:

Majority of the respondents representing 251(97.0%) had heard about cervical cancer with main source of information been TV & radio (81(32.2%)), other sources include, 71(28.1%) from school lectures and 49(19.4%) from friends as shown in figure 2 below.

Majority of the respondents recognized HPV infection as a cause of cervical cancer (240 respondents, 95.6%), 163 respondents representing 64.9% recognized having multiple sexual partners and 84 respondents representing 33.5% recognised having sex before 16 years as a risk factor. A total of 41 respondents representing 16.3% and 1 respondent representing 0.4% recognized smoking and eating contaminated food respectively. Most students knew that HPV caused genital warts (223 respondents, 89.0%). A total of 13 respondents representing 5.0% did not know and 15 respondents representing 6.0% thought genital warts were not caused by HPV.

Knowledge on signs and symptoms of cervical cancer (N=251). Majority 207(82.5%) mentioned abnormal vaginal bleeding as the main symptom associated with cervical cancer with 16 (6.4%) saying it could be asymptomatic.

Most 223(89.2% knew that cervical cancer could be prevented through HPV vaccination. Cervical screening with Pap smear and Visual inspection with acetic acid was mentioned 155(61.8%) and 71 (28.3%) of respondents respectively.

A slight majority, 131(52.2%) knew that girls from the age of 9 to 13 years qualify for the HPV vaccination and 108 respondents (43.0%) also knew that women of any age who have never had sex also qualify for the vaccine.

Only, 98 (39 %) and 85 (34%) of the respondents knew about the availability of the bivalent and quadrivalent vaccine. According to 30 of the respondents, representing 12%, there is no cervical cancer vaccine and 38 of the respondents representing 15% did not know whether or not there are vaccines against cervical cancer.

Levels of knowledge and associated factors:

The students displayed different levels of knowledge. Out of the 251 students who have heard of cervical cancer, 185(73.6%) had fair knowledge, 49(19.4%) had good knowledge and 17(7%) had poor knowledge.

There was a statistically significant association between class level and self-reported knowledge of cervical cancer; $p=0.000$. Higher percentage of students in the higher classes judged themselves to have knowledge on cervical cancer as shown in table 2 and 3below.

Table 1:- Association between Class Level and Self-Reported Knowledge of Cervical Cancer (N=251).

Level	Knowledge of Cervical Cancer		χ^2	p-Value
	No	Yes		
100	6 (15.0%)	34 (85.0%)	27.49	0.000
200	1 (1.6%)	63 (98.4%)		
300	0(0.0%)	98 (100.0%)		
400	0(0.0%)	56 (100.0%)		

Table 2:- Association between Class Level and Knowledge Level on Cervical Cancer (N=258).

Level	Knowledge Level			χ^2	p-value
	Poor	Fair	Good		
100	9(22.5%)	27(67.5%)	4(10.0%)	25.72	0.001
200	3(4.7%)	54(84.4%)	7(10.9%)		
300	5(5.1%)	67(68.4%)	26(26.5%)		
400	1(1.8%)	42(75.0%)	13(23.2%)		

Cervical cancer screening and a HPV vaccine uptake among respondents:

Previous Pap smear:

Only 48 (19%) of respondents had a Pap smear done for them before and 39.6% of them had it more than three years back, and only 16 (6.2%) had received the HPV vaccine as shown as in table 4 and 5 below.

Table 3:- Time since Last Pap smear (N=48).

Time Since Last Pap Smear	Frequency	Percentage (%)
More than 3 years ago	19	39.6
Within the last 3 years	14	29.2
Within the last year	15	31.2
Total	48	100

Table 4:- Vaccination Status of Participants (N=251).

Vaccination status	Frequency	Percentage (%)
Unvaccinated	235	93.8
Vaccinated	16	6.2
Total	251	100

Association between screening, vaccination uptake and knowledge levels:

There was no statistically significant association between knowledge levels and screening and vaccine uptake. There was however a statistically significant association between screening and vaccine uptake as shown in Table 7 and 8 respectively below.

Table 5:- Association between Screening and Vaccination Uptake and Knowledge Levels.

Variable	Knowledge of cervical cancer	p-value
Screening Uptake	-0.079	0.206
Vaccine Uptake	-0.032	0.612

Table 6:- Association between Screening Uptake and Vaccination Uptake.

Variable	HPV vaccine Uptake	p-value
Screening Uptake	0.290	0.000

Reasons for non-uptake of cervical cancer screening and HPV vaccination:

Most, 83(34.3%) respondents had no specific reason, 50 (20.7%) had limited information on cervical cancer, 47 (19.4%) did not know how to get screened and 23 (9.5%) financially constraints. The main reasons for non-uptake of vaccine was unawareness (39.1%) of HPV vaccine, not sexually inactive (27.5%) and high cost of vaccination (20.2%)

Table 7:- Reasons for non-vaccination uptake (N=251).

Reasons	Frequency	Percentage (%)
High cost of vaccination	51	20.2
No reason	13	5.0
Not sexually active	69	27.5
Safety Concerns	1	0.4
Unaware of a vaccine	98	39.1
Time constraints	4	1.6

Discussion:-

The study participants comprised of 258 females with the mean age being 22.62±4.45 years. The minimum age was 17 and the maximum age was 42 years. Majority (241) of the respondents were Christians and this correlates with the religious distribution observed in Ghana. Most (88.4%) of the participants were single as the study was conducted among young females who are still in school.

This study revealed a high level of cervical cancer awareness among female nursing students and as expected the higher the class the higher the proportions of awareness. Unfortunately, it would have been expected that the higher awareness is due to information coming from curricula on such an important and largely preventable disease instead it is attributable to main source media (TV & Radio) which sometimes superficial with occasional erroneous information. It is therefore important that such conditions be probably introduced early in curricula to improve the likelihood of preventive measures been adopted.

Only 19.4% of participants had good knowledge on cervical cancer with increasing knowledge level associated with higher class level as expected. This finding is much lower than the 81.5% good knowledge found in a similar study conducted in Saudi Arabia among nursing students. (Eittah et al., 2020). The reasons for this disparity is not clear but could be speculated that Saudi Arabia been wealthier could have a stronger awareness campaign with the facilities for prevention.

This study also found that 61.8% and 89.2% of the respondents knew that the Pap smear and HPV vaccination as preventive measures against cervical cancer respectively. The figure for Pap smear is low compared to a study

conducted in India where 91.2% of the participants knew that the Pap smear is a preventive measure against cervical cancer (Krishnaveni et al., 2018). The India study was community based whereas this study is school based, many factors could be responsible for this difference including local drive community programs on cervical cancer prevention, which notwithstanding female nursing students would be expected to have more knowledge on health-related issues.

This study revealed that 64.9% of the participants knew that having multiple sexual partners is a risk factor compared to the 2.3% found in a community study in Elmina, Ghana (Ebu et al., 2014). Besides the different study setting information access has improved over the last decade and may be partly responsible for this difference.

Cervical cancer mostly presents asymptotically until the disease is advanced (Meites et al., 2021). Only 6.4% of the respondents knew this and knowledge of this affects health seeking behavior especially screening and prevention.

In general, the level of knowledge on cervical cancer was fair (73.6%). but needs to be improved and in good time to affect practices as they would need good knowledge on the topic as health professionals in order to educate patients and the general public on cervical cancer.

The study revealed that the prevalence rate of cervical cancer screening among the female nursing students was only 19%. This was similar to results found in a study that was conducted in India where 82.2% of the women had never been screened (Krishnaveni et al., 2018). The low screening prevalence is largely a mirror of what it is in the general population of most developing countries.

A significant number (39.6%) had their last Pap smear over three years ago and 31.2% had theirs done within the last year. Hence for majority of those that had had a Pap smear done before, it was done more than three years ago and has not been followed up with another Pap smear. This was not encouraging as the recommended screening schedule is at three year intervals. Most screening in the Ghana are opportunistic and could account for the delay in repeat scheduled screening. Also, inadequate information on cervical cancer and facilities that offer screening and vaccination services is an important barrier to cervical cancer screening and vaccination (Fentie et al., 2020). This was demonstrated in the study as 20.7% of the respondents had not taken part in cervical cancer screening because they had limited information on cervical cancer and 19.4% of the respondents did not know how to get screened. However, 21.5% of the respondents had not taken part in cervical cancer screening because they were not sexually active while 21.1% did not engage in risky sexual behavior hence had not taken part in cervical cancer screening. This demonstrates the inadequacy of the knowledge of respondents on cervical cancer and the targets for screening and vaccination.

The study revealed that majority (93.8%) of the respondents are unvaccinated which is similar to the 98.9% of unvaccinated respondents in India (Krishnaveni et al., 2018). Only 16 respondents (6.2%) have been vaccinated and out of this number, 12(75%) were not sure of the type of vaccine used. Three (18.75%) of them received the quadrivalent vaccine and one (6.25%) received the bivalent vaccine. This could be due to the fact that pre-vaccination education provided by healthcare service providers is inadequate and the options available as well as the strains of HPV covered are not made clear to recipients.

Despite the fact that most of the respondents (97%) have heard of cervical cancer, they were largely unaware of the availability of vaccination services in Ghana (39.1%). A significant percentage (27.5%) had not taken part in cervical cancer vaccination because they were not sexually active. This further proves that indeed, the knowledge levels of respondents on the targets for screening and vaccination are inadequate. A significant percentage (20.2%) of the respondents however attributed their unvaccinated status to the high cost of vaccination since the National Health Insurance Scheme (NHIS) does not cover it

There was no significant association between knowledge levels and variables like screening uptake and vaccination uptake not surprising as knowledge does not directly translate to action within the mist of multiple determinant factors including access in all its forms. There was however a statistically significant association between screening uptake and vaccination uptake this could be related to both awareness and financial capability.

Study Limitations:

This was self-reporting especially on practices and could not be devoid of social desirability though anonymity was guaranteed.

The study classified knowledge as good, fair and poor using the criteria that were used in another study. This is not validated and may not be reproducible.

Conclusion:-

The knowledge on cervical cancer was fair and knowledge levels improved with respondents at higher class levels. Prevalence of cervical screening and HPV vaccination was very low. Common reasons given for non-screening and non-vaccination were limited information on cervical cancer including unawareness of vaccine, not been sexually active and high cost of vaccine. There was significant association between screening uptake and vaccination uptake, though no association between knowledge and both screening and vaccination uptake

Conflict of interest:

None declared

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on request

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