



Knowledge and Attitude Towards Cervical Cancer Among Female Students in Chattogram, Bangladesh

DR. Shamanti Muhury

Roll No: 0119/08

Registration No: 735

Session: 2019-2020

**A thesis submitted in partial fulfillment of the requirements for the degree of
Masters in Public Health**

**One Health Institute
Chattogram Veterinary and Animal Sciences University
Chattogram-4225, Bangladesh**

June 2022

Authorization

I hereby declare that I am the sole author of the thesis. I also authorize the Chattogram Veterinary and Animal Sciences University (CVASU) to lend this thesis to other institutions or individuals for the purpose of scholarly research. I further authorize CVASU to reproduce the thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

I, the undersigned, and author of this work, declare that the electronic copy of this thesis provided to the CVASU Library, is an accurate copy of the print thesis submitted, within the limits of the technology available.

DR. Shamanti Muhury

June 2022

**Knowledge and Attitude Towards Cervical Cancer
Among Female Students in Chattogram,
Bangladesh**

DR. Shamanti Muhury

Roll No: 0119/08

Registration No: 735

Session: 2019-2020

This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made

.....
Prof. Sharmin Chowdhury

Supervisor

.....
Director, One Health Institute

**One Health Institute
Chattogram Veterinary and Animal Sciences University
Chattogram-4225, Bangladesh**

June 2022

Acknowledgments

The author would like to acknowledge the Almighty Allah for giving her life, hope, courage, strength and perseverance to carry on despite all the challenges. The author feels highly privileged to express her profound sense of gratitude and veneration to her supervisor **Prof. Dr. Sharmin Chowdhury**, Director, One Health Institute, for her valuable and critical suggestions, scientific acumen, perspicacious remarks, scholarly guidance, blessings, and inspiration throughout the course of this study, research works and preparation of this manuscript.

With special pleasure, author acknowledges the Coordinator of Advanced Studies and Research and Committee of Advanced Studies and Research, CVASU for providing her a research grant to accomplish this research work.

Author gives sincere thanks to her family, especially her father, mother, and husband who constantly supported her and also grateful to brother and sisters for their moral support. Very sincere thanks are due to the examiners for helping her to refine the work further.

The author once again records her deep-felt gratitude to all those who not mentioned here but directly or indirectly cooperated in this endeavor.

Table of Contents

Authorization	ii
Signature Page	iii
Acknowledgments	iv
List of Figures	viii
List of Tables	ix
List of Abbreviations	x
Abstract	xi
1. Introduction	1
2. Review of Literatures	6
3. Methodology	17
4. Results	19
5. Discussion	26
6. Conclusions	30
7. Recommendations	30
8. References	31
Appendix A: Questionnaire	41
Brief Bio-Data	44

List of Figures

Figure 1: Conceptual framework	16
Figure 2: Sources of information	23
Figure 3: Willingness and attitude in taking vaccination	24
Figure 4: Different adverse effect that may results from the vaccine of cercal cancer	25

List of Tables

Table 1: Socio-demographic characteristics of participated students	19
Table 2: The level of knowledge about the cervical cancer and its prevention	21
Table 3: The level of knowledge about the development of cervical cancer and its prevention	22

List of symbols and abbreviations

etc	: et cetera
Fig	: Figure
HPV	: Human Papiloma Virus
i.e.	: That is
Min	: Minutes
N	: Total number of samples
°C	: Degree Celsius
Sec	: Seconds
SD	: Standard deviation
WHO	: World Health Organization
%	: Percentage
>	: More than
<	: Less than

Abstract

Cervical cancer is the second most common cancer among women worldwide, with an estimated 493,000 new cases and 274,000 deaths in 2002, about 83% of which occurred in developing countries. Knowledge and attitude of women towards cervical cancer and its preventive techniques is considered as one of the major factors to reduce the incidence. The present study was conducted to assess the knowledge level and attitude features of different aspects of cervical cancer towards its available preventive measures among the of undergraduate female students in Chattogram through prescribed questionnaire. A total of 275 undergraduate female students from different educational institutes of Chattogram District were interviewed for this study. Analyses of the responses showed that 54.3% of the participants were between 20-24 years of age and 87% of students were unmarried. One third of the participants (30.1%) were studying in third year in respective courses. We observed that 76.4% of the respondents have heard about cervical cancer, however, only 24.6% of the participants had knowledge on different screening tests. Only 16.3% respondents (n=275) were able to name relevant tests. Although a good number of participants (58.3%) believe that cervical cancer is a preventable disease, very few students were found to be aware about the different methods of prevention. Surprisingly, a large number of participants (81.5%) did not consider the screening process as one of the effective methods of prevention. Among the respondents who have heard about cervical cancer, most of them heard it from their husband (12.38%), friends (11.52%), and other relatives (11.47%). The findings showed that although many participants have heard of cervical cancer but have insufficient knowledge on its cause, risk factors and preventive measures. Based on this, it might be recommended that awareness programs among the

female students at different levels of education in various institutions of the country to prevent cervical cancer. Further relevant campaign is necessary to successfully control and prevention of this important health issue especially in young women.

Keywords: Bangladesh, questionnaire survey, cervical cancer, public health, risk of women, knowledge and perception.

1. Introduction

Human papillomavirus (HPV) is responsible for causing cervical cancer. Globally, cervical cancer is the fourth most frequent cancer in women with an estimated 530 000 new cases in 2012 representing 7.5% of all female cancer deaths (Rachana and Giri, 2019). Of the estimated more than 270 000 deaths from cervical cancer every year, more than 85% of these occur in less developed regions (Zhang et al., 2019). In developed countries, programs are in place which enables women to get screened, making most pre-cancerous lesions identifiable at stages when they can easily be treated. Early treatment prevents up to 80% of cervical cancers in these countries (WHO, 2006). In the developing countries, cervical cancer is the second most common cancer with an estimated 445 000 new cases in 2012 (84% of the new cases worldwide) (WHO, 2016). Furthermore, it was estimated that, 95% of women in developing countries had never been screened for cervical cancer mainly due to lack of awareness amongst the population (WHO, 2006). This underscores the need for public education which is undertaken by the community health volunteers (CHVs) under the community strategy arrangement.

The women therefore need to be enlightened about cervical cancer to create an enhanced need for screening. Use of CHVs has been shown to be effective in passing health information (Wongwatcharanukul et al., 2014). The community members will be able to determine whether they are at risk or not and hence seek cervical cancer screening services accordingly. The knowledge about the availability of medical services determines how the society embraces and utilizes such services (Williams et al., 2013). It is important to have medical services available and accessible to the community in order to promote prevention, management and cure of medical conditions (Kantelhardt et al., 2014).

Finally, the knowledge of an individual is influenced by various factors, which act as a system on various specific issues to have a net effect on an individual's general knowledge. These factors are collectively summed as socio-demographic factors and include indicators like gender, age, education level, religion, marital status and occupation.

In developing areas like sub-Saharan Africa, 34.8 new cases of cervical cancer are diagnosed per 100,000 women annually, and 22.5/100,000 die from the disease, making it the second most common cancer after breast cancer (Ferlay et al., 2012). The disease burden is significantly higher in the developing countries with lower screening rates; largely due to lack of screening that allows detection of pre-cancerous stages and early-stage cervical cancer. Data from hospital-based registries in Kenya indicated that cancer of the cervix accounts for 70-80% of all cancers of the women genital tract (GoK, 2015). Despite the magnitude of the problem in Kenya and the fact that it is easily preventable, cervical cancer screening coverage in Kenya for all women aged 18 to 69 years is only 3.2% against a target of 70% coverage and the uptake of screening has been poor due to inadequate knowledge by the general population (Rosser et al., 2015a). This trend requires public education to reverse and improve screening in order to identify those at risk of cervical cancer and to decrease the prevalence. However, their ability to create demand for the screening services depend largely on their ability to pass the right information to the community members. Disease manifestation is very important in its diagnosis, management and treatment (Maree and Kaila, 2014); therefore, health service providers must know the right signs and symptoms to look for in order to give the right and timely medical attention for any disease in order to curb the development and spread of the

disease. The right information can also be passed to the public to enable them seek timely medical attention on noticing such signs (Fylan, 1998; Can et al., 2014; Driscoll, 2015). The most appropriate channel to pass this information is through the community gatekeepers, the CHVs. Having the right information regarding signs and symptoms of cervical cancer in the community create demand for the available screening services at the health facilities and enhance screening to establish the cervical cancer prevalence rate.

Enlightened women, who have access to information about their health and are able to make informed decisions have been shown to be more likely to seek cervical cancer screening (Coronado Interis et al., 2015; Shakya et al., 2016), while a high level of knowledge about cervical cancer was found to be a key predictor of screening intent (Rosser et al., 2015b). To enhance cervical cancer screening and early detection, it is important that the women access the most critical information including the risk factors, signs and symptoms and where the screening services can be accessed (Wongwatcharanukul et al., 2014).

According to WHO, a risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury (WHO, 2006). Some examples of the risk factors for cervical cancer are early onset of sexual activity, HPV infection, smoking and immune-suppression (Bosch et al., 2006). Prevention and control of disease and injury require information about the leading medical causes of illness and exposures or risk factors. This creates a focus on areas which can be changed or avoided rather than those which cannot be changed (Mohanty and Ghosh, 2014). Those exposed to the risk factors that cannot be changed can also go for early and regular check-ups. Knowledge about the risk factors is therefore a very important component of disease

prevention and control. With the right information, the community members will be able to determine whether they are at risk or not and hence seek cervical cancer screening services accordingly. The knowledge about the availability of medical services determines how the society embraces and utilizes such services (Williams et al., 2013). It is important to have medical services available and accessible to the community in order to promote prevention, management and cure of medical conditions (Kantelhardt et al., 2014).

Finally, the knowledge of an individual is influenced by various factors, which act as a system on various specific issues to have a net effect on an individual's general knowledge. These factors are collectively summed as socio-demographic factors and include indicators like gender, age, education level, religion, marital status and occupation. Previous research on HPV and cervical cancer risk has demonstrated limited knowledge among women in developed countries. One study demonstrated that physicians were not routinely providing HPV information to their female patients and younger physicians were more likely to discuss the topic of HPV compared to those who are older. In Bangladesh there is very little awareness among the general population, health care professionals and policy makers about HPV infection, the availability of the HPV vaccine and cervical cancer preventive measures. Understanding HPV epidemiology will help inclusion of HPV vaccinations in future cancer prevention strategies and other HPV-based screening programs for prevention of cervical cancer in Bangladesh.

Moreover, understanding of women's current levels of knowledge and perception about cervical cancer, perception of and attitude towards their own cancer risk and its prevention will be keys in developing effective HPV prevention strategies.

Objectives:

1. To assess female student's knowledge towards cervical cancer.
2. To understand female student's attitude towards preventive measures of cervical cancer.

2. Literature Review

Human papillomavirus (HPV) is the most common viral infection of the reproductive tract globally and most sexually active women and men will be infected at some point in their lives.¹ Human papillomavirus is sexually transmitted and most infections are usually acquired shortly after becoming sexually active. Human papillomavirus infection is well recognized as the cause of nearly all cases of cervical cancer. Cervical cancer can be prevented through the use of specific interventions such as health education (on delayed sexual debut, practice of safe sex, benefits of HPV vaccination) and prophylactic vaccination against HPV. It can be completely cured when diagnosed early after the use of screening methods such as Papanicolaou (Pap) smear test.

2.1. Knowledge on Cervical Cancer

There have been several cross-sectional studies to describe the knowledge about cervical cancer in various set-ups with most of these studies pointing to low knowledge (Lindau et al., 2002; Tarwireyi et al., 2003; Anorlu, 2008; Oranratanaphan et al., 2010). In a systematic review of literature using the Health Belief Model, it was noted that the commonly held beliefs about cervical cancer across several cultural groups include: cancer being fatal and a death sentence, a lack of knowledge about cervical cancer and need for screening, fear of Pap smears threatening one's virginity, as well as beliefs that a Pap smear is unnecessary unless one is ill (Johnson et al., 2008). This review only took into account the beliefs of the study participants and overlooked the knowledge which is necessary to make informed decisions pertaining to their health. In addition, the review did not assess the possible sources of information to the community. However, it showed

that mis-information and negative beliefs hinder uptake of cervical cancer screening. As such, it concluded that it is necessary to interrogate the sources of health information in order for the community to have accurate information.

There are also beliefs that cervical screening is related to sexually transmitted infections (STI) diagnosis due to the limited understanding of female reproductive system and associated diseases (Bingham et al., 2003). In Tanzania, a majority of nurses were found to have inadequate knowledge on transmission of HPV, causes, risks factors, symptoms, treatment and prevention of cervical cancer (Urasa and Darj, 2011). This study assessed the knowledge of the nurses and pointed out the training needs of the nurses emanating from the weakness in their training curriculum. The nurses, through their formal training are supposed to be well equipped to provide information on the screening services; however, they can only reach those already seeking such services. On the other hand, those who do not have the information and are yet to seek cervical cancer screening services need the CHVs to provide them with the accurate information and create demand for cervical cancer screening. This therefore requires that the knowledge of CHVs on cervical cancer be assessed too.

A study in Kenya to assess knowledge and practice about cervical cancer and Pap smear testing among cervical cancer and non-cancer patients demonstrated that fifty-one per-cent of the respondents were aware of cervical cancer while 32% knew about Pap smear testing, there is need. Therefore, to increase the knowledge and awareness about ICC and screening among Kenyan women to increase uptake of the currently available hospital screening facilities (Gichangi et al., 2003). This study assessed the knowledge of the patients already seeking curative services but did not address issues of preventive and promotive health services, which

have better outcomes as per cervical cancer management. It would therefore be prudent to extend and assess the knowledge of the general population on cervical cancer and screening services. The knowledge of the community about cervical cancer can only be assessed after the CHVs carry out public education, which is only possible, if the CHVs have the right information to pass to the community. Further, in a study to assess knowledge, attitudes, and practices regarding cervical cancer among rural women of Kenya, findings showed that 40% knew about cervical cancer, although many still lack factual information (Gatune and Nyamongo, 2005). This study assessed the knowledge of the rural women on risk factors, pointing out the need to educate women in order to scale up screening services, however, it did not assess the knowledge on the screening service options available, the cost and the duration –very key elements in determining the ability of the population to utilize the available screening services for cervical cancer. This knowledge in the community needs to be enhanced, through engagement of the CHVs.

Generally, the knowledge about cervical cancer is low in general and the lack of awareness of cervical cancer and the benefits of early detection measures are critical barriers that affect women's participation in screening programs (Ngugi et al., 2012). This study never addressed the source of the information which would include the sensitization by the CHVs who are the primary source of health information to the community under the community strategy. Generally, it is necessary to educate the community gate keepers to disseminate the right information to the public and improve uptake (Wongwatcharanukul et al., 2014). From the previous studies above, it was observed that no attempts were made to assess and train community gate keepers such as the community health volunteers

2.2. Knowledge on Risk Factors Associated with Cervical Cancer

In a study to determine knowledge about cervical cancer risk factors, traditional health beliefs and Pap smear testing among Vietnamese-American women, the proportions of women who knew that older age, not getting regular Pap tests and Vietnamese ethnicity were associated with an elevated cervical cancer risk were only 53%, 62%, and 23%, respectively. The majority (87%) incorrectly believed poor women's hygiene is a risk factor for cervical cancer. Knowing that lack of Pap testing increases the risk of cervical cancer was strongly associated with recent Pap smear receipt (Do et al., 2007). This study only assessed the knowledge of the women on the risk factors and pointed out how having the right knowledge encourages cervical cancer screening while misconceptions and beliefs discourage uptake of screening services. The study did not extend to address the sources of such information. This trend was also observed in another study in Britain in which the awareness of human papillomavirus (HPV) as risk factor of cervical was assessed and shown to be only 2.5% in the study population (Marlow et al., 2007). This study was able to point out the need for public education on the risk factors of cervical cancer to improve the uptake of screening services. However, the weakness of this study was to fail to elucidate the role of CHVs in public education in the field of health.

Another study in Uganda among the medical workers suggested that less than 40% knew risk factors for cervical cancer, eligibility for and screening interval (Mutuyaba *et al.*, 2006). These findings were attributed to the weaknesses in the training curriculum, however, the training manual for the CHVs provided for training on the risk factors associated with cervical cancer but no post-training evaluation on knowledge of the CHVs had been done. Both the general population and the medical workers are therefore not conversant with the risk factors

associated with cervical cancer thereby hampering the screening efforts. A study carried out amongst the nurses and midwives in Ethiopia showed that awareness on the risk factors associated with cervical cancer was low (Kress et al., 2015), due to lack of training on the risk factors of cervical cancer. These findings were replicated in another study carried out in Poland where knowledge about risk factors was found to be poor amongst the study participants (Gawdzik et al., 2015). This study did not however assess access to such information, which is possible through the CHVs. The CHVs however, must have the right information to pass to the community.

Another study among the Turkish women reported that the knowledge of the women on cervical cancer risk factors (having a sexually transmitted disease, giving birth to many children, smoking, having sexual activity with a man who has had partners with a cervical cancer and having sexual intercourse at an early age) is related with their condition of having Pap testing (Uysal and Birsal, 2009). This study emphasized the need for public education and involvement of health care workers who are linked to the community by the CHVs. This is in line with another study carried out in Eldoret, Kenya to determine the perceptions of risk and barriers to cervical cancer screening which noted that perception of being at risk was significantly associated with a felt need for screening (Were et al., 2011). Knowledge of the risk factors is important in determining whether a woman goes for screening or not.

2.3. Knowledge on Signs and Symptoms of Cervical Cancer

A study to determine population knowledge, attitudes, and personal practices regarding prevention and early detection of cancer in upper-mid-western states, USA established that the knowledge of warning signs/symptoms of cancer was low (Bostick et al., 1993). This was attributed to the fact that information about cervical cancer was still lacking and policies were

just being put in place to encourage screening. It did not, however, extend to assess how such information was being accessed and its accuracy. This was supported by a study on cervical cancer screening, knowledge and practices among Korean-American women which noted that the most frequently cited reason for not having had a Pap smear test was inability to identify the disease symptoms (Kim et al., 1999). This study only targeted those advanced age group of 40-69 years ignoring the women of reproductive age. Although, it showed that education and the source of the health service are significant in possession of the relevant information, it did not explore the source of such information. Another study to determine knowledge about cervical cancer early warning signs and symptoms, risk factors and vaccination among students at a medical school in Al-Ahsa, Saudi Arabia, noted that a majority of the students were not aware of the early warning signs, symptoms and risk factors. On average, only 43.7% males and 56% of females were aware about the early signs and symptoms (Al-Darwish et al., 2014). This study did well to assess the knowledge of the upcoming professionals; however, it did not consider the fact that these professionals only have access to those already seeking health services. Inability to identify the signs and symptoms is a hindrance to the uptake of the screening services, as was demonstrated amongst university students in Ghana whose poor knowledge was accompanied by poor screening habits (Binka et al., 2016). This study showed that despite the fair perception about cervical cancer, knowledge was important in determining screening status of the participants. The study emphasized the need to pass accurate information to the community in order for them to seek screening services. A study among the women of Zambia revealed that the women knew and understood very little about this disease and had the opinions of others who knew equally as little but were quite willing to speak out, judge, and reject (Maree and Kaila, 2014).

This study exposed how lack of the right information can lead to stigma and discrimination, which in turn leads to poor health seeking behaviours. This low knowledge about the signs and symptoms was also evident in a study in India where awareness about the cause, signs and symptoms, prevention of cervical cancer, PAP test and HPV vaccination was 3.6%, 6.3%, 3.6%, 9.5% and 14.5% respectively (Raychaudhuri and Mandal, 2012). Further findings from a study at Jaramogi Oginga Odinga Teaching and Referral Hospital Kisumu showed that knowledge on the signs and symptoms of cervical cancer was an important determinant for being screened for cervical cancer (Morema et al., 2014). The previous studies above overlooked the role of community health volunteers in promoting health in the community through passage of the right information.

2.4. Knowledge on the Availability of Cervical Cancer Screening Services

In Sri-Lanka a study among female health workers noted that 3% do not know about availability of the cervical cancer screening services and therefore do not seek screening. The study findings suggest that the knowledge and practices on cervical cancer screening methods among female health care workers need to be improved. Considering the role that health care workers play in communicating health behaviours to the general public, strengthening health education interventions for this group of females is essential (Nilaweera et al., 2012). This study was limited in scope since it only assessed knowledge among medical workers who are already trained on cervical cancer under the formal medical training and could not explain the low cervical cancer screening coverage. It does however give a pointer that the poor knowledge results in the low screening rates. This is in agreement with a study to determine cervical cancer awareness and cervical screening uptake at the Mater Misericordiae Hospital, Afikpo, Southeast Nigeria, which concluded that lack of awareness on availability of

screening centres locally, cost and time were the main reasons adduced by respondents for not being screened (Eze et al., 2012). Still a study among the rural and urban women of Nigeria established that the most important factors hindering the use of available cervical cancer screening services were lack of knowledge (49.8%) and the feeling that they had no medical problems (32.0%) (Nwankwo et al., 2011). These two studies from Nigeria underscore the importance of the community being educated on the availability of the screening services if cervical cancer screening rates are to improve. Public education can be done effectively by the CHVs if they have the right information.

A study to determine the influence of partner communication on breast and cervical cancer screening and the perceived existing and potential support from male partners in participating in cancer screening in Mexican immigrants concluded that cervical cancer education is desperately needed, including education on the availability of free and low- cost screening services (Thiel de Bocanegra et al., 2009). This is supported by another survey to assess the knowledge of cervical cancer and use of cervical cancer screening facilities among women from various socioeconomic backgrounds in Durban, Kwazulu Natal, South Africa where the majority of patients from lower socio-economic circumstances with multiple risk factors were not aware of cervical screening or facilities available for this purpose (Wellensiek et al., 2002).

Furthermore, a study among college students in Ghana to determine their knowledge and beliefs about cervical cancer screening established that women were unaware of local screening initiatives and only 7.9% were aware of the link between HPV and cervical cancer. The most prevalent barriers were lack of awareness that the purpose of Pap screening is to diagnose cancer and lack of information about how to obtain screening services (Abotchie

and Shokar, 2009). This low knowledge even among the literate segment of the society points to a weakness in the training curriculum coupled with the lack of policy on public education to pass information to the general community. This low knowledge level was also evident amongst the Sikkimese nursing staff in India with only one-third knowing when screening should start (Rahman and Kar, 2015).

2.5. Socio-Demographic Factors Affecting the Knowledge on Cervical Cancer

A study amongst Students of the University of Medicine and Pharmacy of Tîrgu Mureş, Romania indicated that the knowledge about HPV infection among students in their first year of medical school was significantly lower compared to 6th year students, which suggests that some basic information was acquired throughout their years in medical school (Voidazan et al., 2016). This is an indication that the level of education significantly affects knowledge about cervical cancer. Further, a study among female students at Balikesir University, Turkey showed that HPV knowledge score of the students attending the faculty of medicine was higher compared to the students attending other departments and their HPV vaccine knowledge score was higher compared to the students attending nursing and para-medics students (Yoruk et al., 2016), this is an indication that occupation affects knowledge on cervical cancer. The previous studies (Voidazan et al., 2016; Yoruk et al., 2016) only assessed the socio-demographic factors affecting knowledge of the students who are still within the confines of the learning institution but did not extend to determine how these factors would change in the actual work environment during application of the knowledge acquired in the university.

A study amongst healthcare providers in Puerto Rico, revealed that knowledge about cancers in general varied with years of service and academic qualifications (Colon-Lopez et al., 2016)

where more years of service was associated with more experience therefore better knowledge while higher academic qualifications would also mean being more knowledgeable. On the other hand, study amongst Ethiopian healthcare workers found that, knowledge about cervical cancer risk factors and available screening services was significantly associated with occupation (Kress et al., 2015), however, it did not determine which socio-demographic factors are associated with knowledge about the signs and symptoms of cervical cancer.

Another study among men in Kenya showed that knowledge about cervical cancer was significantly associated with education levels and demonstrated that higher education was associated with higher scores (Rosser et al., 2014). In a study among the Acholi in northern Uganda, it was found that knowledge of cervical cancer varied by respondents' age and gender (Mwaka et al., 2014). Older people and women were found to have better knowledge about cervical cancer. Still, a study carried out in low income setting in China found that low income and illiteracy were two reliable factors affecting awareness before or after education intervention (Simayi et al., 2013), this is similar to findings from China where a study amongst Chinese women found that educational base significantly affected knowledge on cervical cancer (Holroyd et al., 2004).

2.6. Conceptual Framework

Socio-demographic factors like religion, traditional beliefs, occupation and education; availability of the cervical cancer screening services all affect knowledge levels and how people take care of their health (Thuler et al., 2014). Knowledge level on the risk factors and signs and symptoms of cervical cancer is an important determinant for being screened for cervical cancer. Furthermore, women who do not know about the disease or are not aware

about their susceptibility to it has a higher likelihood of not being screened (Morema et al., 2014) as shown in **Figure 1** below:

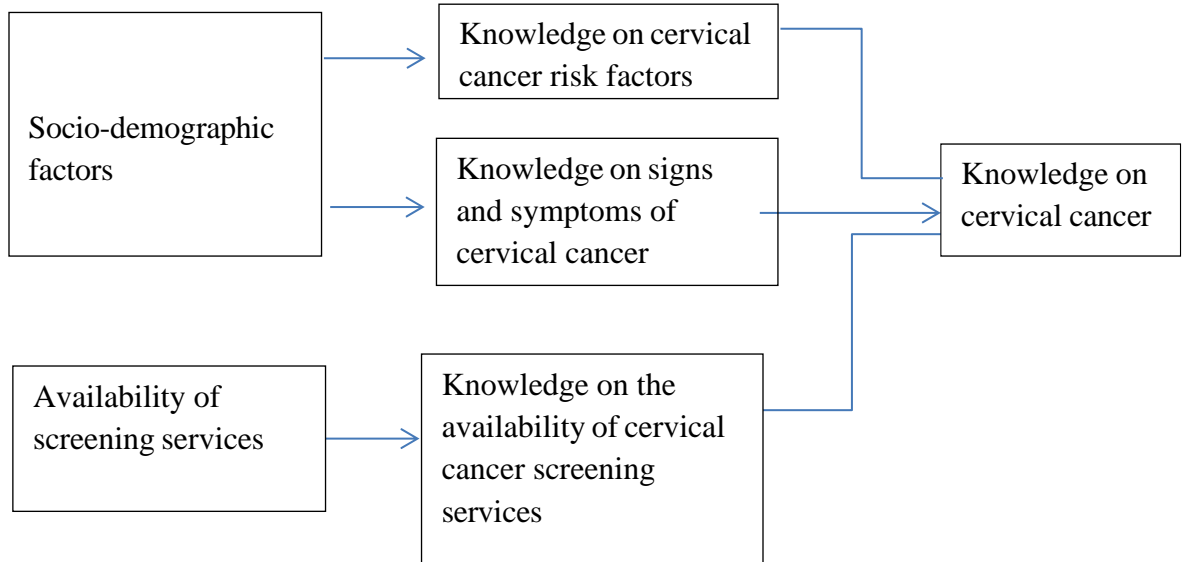


Figure 1: Conceptual framework. Adapted from Kjaer et al., (1997)

3. Methodology

3.1. Study Design and Study Population

A community/educational institution based cross sectional study has been implemented in selected women colleges/university in Chattogram city of Bangladesh. Female college/university students were recruited from 2 tertiary level educational institutions- Asian University for Women and Chittagong Government Women's College. Both married and unmarried students were approached to participate. A non-probability convenient sampling technique where samples (female students) were recruited based on their verbal consent to participate in the survey. From the selected educational institutes, 150 students were approached to participate in the study. For selection of students, certain classes were randomly selected within a college/university and all students in the class were invited to participate in the study. Based on information of class size, required numbers of classes were determined.

3.2. Data Collection

A semi-structured questionnaire was used for data collection through face-to-face interview administered by the primary researcher. A comprehensive literature review was done to design the questionnaire. Although the questionnaire was designed into English later it had translated into Bengali during collecting the data from the participants. Information was collected on socio-demographic characteristics, reproductive history, risk factors of cervical cancer/HPV and knowledge, attitude and perception of cervical cancer, HPV, HPV vaccine, screening and preventive strategies. The questionnaire was

pre-tested before the final survey. Most of the questions were close-ended questions with 'Yes' and 'No' answers. Few questions were designed based on the multiple-choice options where participants were allowed to choose more than one answer. These questionnaires were provided to those students who have selective criteria matched with this study. This survey was conducted mostly similarly to an interview. Before conducting this survey, respondents were given detailed knowledge regarding this study so that participants can understand the importance of this study and informed consent was taken from each participant. Moreover, every question was asked by the primary researcher to avoid all sorts of biases.

3.3. Data Analysis

Data from the questionnaires were analyzed using the Microsoft Excel and Statistical Package for Social Sciences (SPSS version 20; IBM Japan, Tokyo, Japan). A descriptive analysis was done to describe the socio-demographic characteristics, anthropometries, risk behaviours of the female students included into the study. Firstly, data were summarized by using descriptive statistics and presented in tables and figures. Composite scores related to knowledge of and attitude towards cervical cancer, and prevention strategies were calculated and compared among the sub-groups. Binary logistic regression analysis was done to understand factors related to having better knowledge and intention of having vaccine or screening test when needed.

4. Results

4.1. Descriptive statistics of the study population

A total 300 female students were approached in two different female colleges of Chattogram district and got 275 complete responses. Demographic characteristics such as age, religion, academic level, marital status of the respondents are described in Table 1. From the descriptive analysis of the data, it was observed that among all the respondents 34% of female students were in the age group of less than or equal to nineteen years old, 54.3% were between 20-24 years old and 14.9% participants were 25 years and above.

Table 1: Socio-demographic characteristics of participated students.

Socio-demographic characteristics		Frequency	Percentage
Age	≤19	84	30.5
	20-24	150	54.5
	≥25	41	14.9
Religion	Islam	215	78.2
	Hindu	33	12.0
	Buddhism	18	6.5
	Christian	9	3.27
Academic Level	First year	73	26.5
	second year	73	26.5
	Third year	82	29.8
	Fourth year	24	8.7
	Post graduate	23	8.3
Marital Status	Single	240	87.3
	Having relationship	15	5.5
	Married	17	6.2
	Divorced	3	1.0

Among the total of 275 respondents, nearly 78.2% were Muslim, 12% were Hindu, approximately 6.5% Buddhist, 3.27% were Christian. Eighty seven percent of the students were unmarried and most of them (29.8%) were studying third year of their under-graduate education.

4.2. level of knowledge about the cervical cancer and its prevention

Table-2 represents the knowledge level of participants on cervical cancer and its prevention. Descriptive analysis showed that almost 76.4% participants heard about cervical cancer; nearly 64.9% participants have no idea about papilloma virus though. 62.3% of the respondents did not know that papilloma virus can cause cervical cancer whereas only 31.5% participants gave positive answers on it. Analysis showed that only 24.6% participants have knowledge on different screening tests in which nearly 16.3% respondents could mention some name of the tests. On the other hand, in case of vaccination, the knowledge level was found a bit higher among the participants. About 33.7% female students had proper knowledge about the vaccination against cervical cancer. It indicates that the majority of the students are more aware about the vaccination compared to other preventive methods.

4.3. level of knowledge about the development of cervical cancer and its prevention

The students who heard about cervical cancer, most of them did not have sufficient knowledge about the different ways of acquiring cervical cancer. According to the responders, the most common factors of developing cervical cancer were infection of certain organism (27.5%), unhygienic practices during menstruation (25.3%) and sexual intercourse without condom (25.3%).

Table 2: The level of knowledge about the cervical cancer and its prevention

Questions regarding knowledge and prevention of cervical cancer/Variables		Frequency	Percentage
Have you heard about cervical cancer?	Yes	211	76.7
	No	64	23.3
Have you heard about human Papilloma virus?	Yes	92	33.5
	No	183	66.5
Do you know that human Papilloma virus can cause cervical cancer?	Yes	88	32
	No	187	68
Do you know cervical cancer is preventable?	Yes	162	58.9
	No	113	41.1
Do you know about cervical cancer screening test?	Yes	68	24.7
	No	207	75.3
Can you remember any name of screening test?	Yes	46	16.7
	No	229	83.3
Do you know about available vaccine of cervical cancer?	Yes	93	33.8
	No	182	66.2

Apart from that, other unhygienic practices (14.56%) were considered as the next common factor of getting affected with cervical cancer. However, a few students (7.27%) indicated food as one of the potential ways of developing cervical cancer. From the descriptive analysis, it was recorded that although most of the participants have heard about cervical cancer, only few have proper knowledge on the different means of developing cervical cancer. In addition to this, knowledge about the prevention method of cervical cancer was also found very limited among the students. Although a good number of participants (58.3%) believe that cervical cancer is a preventable disease, very few students were found to be aware about the different methods of prevention. Furthermore, when the participants

were asked about different prevention methods, the majority of them found not to have proper knowledge on different methods. As far as the prevention methods of cervical cancer are concerned, medicine was cited as one of the preventive methods by 39.15% of total participants whereas nearly 65.1% participants thought that cervical cancer cannot be prevented only by medicine. However, 41.5% students mentioned vaccination as a preventive method against cervical cancer, followed by 23.6% of the respondents mentioned that regular gynecology is one of the effective methods to prevent cervical cancer. Very few students (18.1%) indicated “the examination or screening test” as a preventive method; a majority of the total participants (81.5%) did not consider this as one of the effective methods. Apart from that, nearly 8.3% respondents thought that there might be other effective methods available in preventing this cancer. In assessing the knowledge, it can be observed that the knowledge about screening tests is less in comparison to the knowledge of other preventive methods.

Table 3: The level of knowledge about the development of cervical cancer and its prevention

Questions/variables	Frequency (n)	Percentage (%)
Ways to develop cervical cancer		
Food	23	7.27
Unhygienic practices during menstruation	80	25.3
Sexual intercourse without condoms	80	25.3
Infection of certain organisms	87	27.5
Other unhygienic practices	46	14.56
How to prevent cervical cancer		
Medicine	83	39.15
Routine Examination/Screening	50	23.6
Vaccination	88	41.5

4.4. Source of knowledge

Of the 275 students (76.4%) who have heard of cervical cancer, majority of them heard from their husband (12.38%), friends (11.52%), and other relatives (11.47%) (Figure 2). Furthermore, 11.02 % students came to know about this cancer from radio, followed by 10.61% from television. Apart from this, some of the respondents heard about it from social media (10.39%), and newspapers (10.45%).

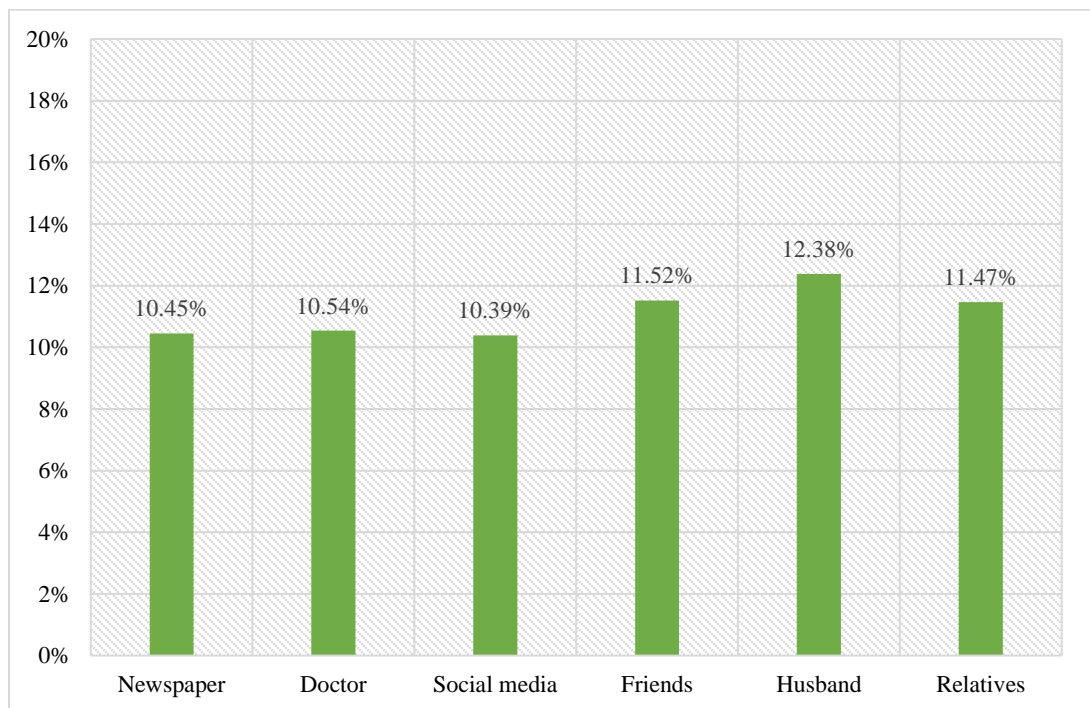


Figure 2: Sources of information

4.5. Willingness and attitude in taking vaccination

Figure 3 presents the willingness and attitude of the participants towards screening tests and vaccination of cervical cancer. About 60.1% of the students showed interest in taking several screening tests against cervical cancer. When they were asked, if they would like to take any vaccine to prevent cervical cancer, nearly 33.7% respondents said yes, 31.2%

said no and 31.5% said they do not know about it. The majority of participants were also willing to suggest the vaccine to their friends (79.7%). Participants were asked if they think that there would be any adverse effects resulting from the vaccine; almost 26.4% reported yes, 16.3% said no and 52.9% cited they do not know at all. Nevertheless, the perception about the adverse effect of vaccination seemed to be varied person to person. About 15.6% students said the adverse effect of vaccines is risky whereas 8.3% participants thought there is no risk at all followed by 9.1% participants thought that there are some risks associated with the vaccine.

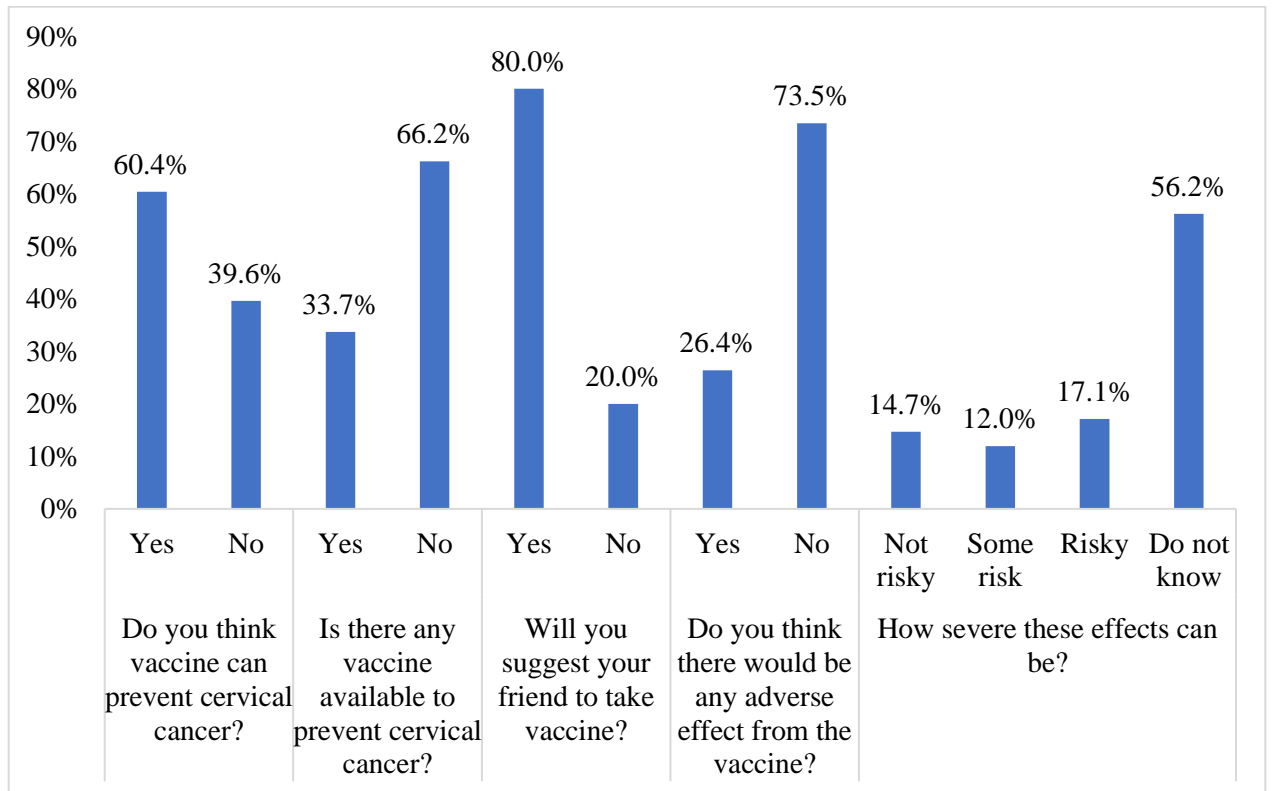


Figure 3: Willingness and attitude in taking vaccination

In response to the question regarding name of some common adverse effects may found after vaccination, respondent named most frequently fever, pain, rash, allergy, ill-health, death, other health problems etc. which are presented in Figure-4. In this Figure, it can be

seen that approximately 15.08% students reported fever as one of the most common adverse effects that may result from the vaccine. Over 12.73% cited that ill-health might follow after vaccination which may cause death (12.73%) of people. In addition to this, some reported that sometimes rashes (12.61%), allergy (12.51%), pain (12.01%) and other health problems (12.32%) may result from taking vaccine.

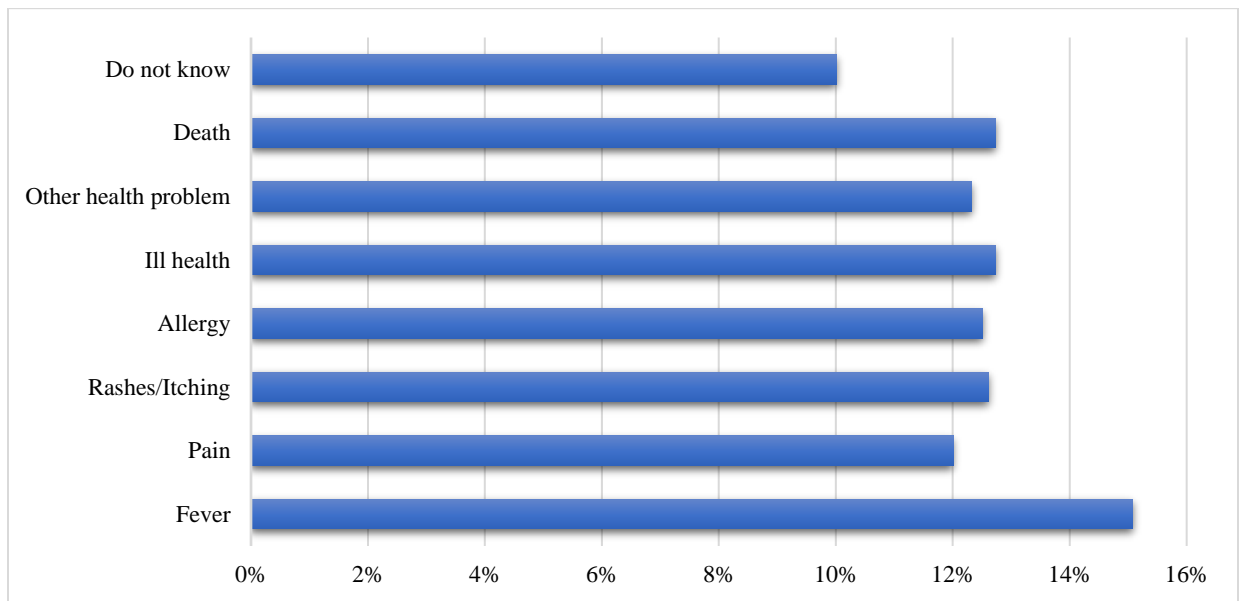


Figure 4: Different adverse effect that may result from the vaccine of cervical cancer

5. Discussion

In Bangladesh, cervical cancer remains the second most common cancer among women despite global advances in its prevention and treatment (Begum and Shuayb, 2016). Knowledge of cervical cancer and primary prevention through vaccination was observed low, indicating a major public health concern for the nation. Numerous studies have been performed worldwide, particularly in developed countries to evaluate the knowledge, attitude, and awareness about cervical cancer and HPV. In the present study, the aim was to understand the knowledge, attitude, and awareness of cervical cancer and PAP smear among female students in Chattogram.

The results showed low levels of cervical cancer and HPV knowledge and its prevention regardless of their socio-demographic characteristics. A previous study found 6.1 percent of respondents having knowledge of cervical cancer (Abiodun et al., 2013). Noticeably majority of the female students reported having heard of cervical cancer whereas very few female students have knowledge on HPV. This finding can be attributed to the fact that only few of the respondents have knowledge of human papilloma virus as the cause of cervical cancer. Chinaka and Udejah (2012) corroborated this finding by reporting that there is a dearth of information on knowledge of HPV among women in Nigeria.

During the present study, a limited number of participants were able to identify causes of cervical cancer. Only 31.5% participants had the knowledge that HPV can cause cervical cancer. Previously published literature similarly stated that greater percentage of the students had no knowledge of the cause of cervical cancer as only 35 percent of the respondents rightly agreed with that human papilloma virus as the cause of cervical cancer whereas the rest of the respondents had misconceptions on the cause of cervical cancer

(Dillman et al., 2009; Dim et al., 2012). Female students marked unhygienic menstrual practices, unsafe sexual intercourse, and infection by certain organisms as the causes of cervical cancer.

In addition to this, knowledge about the prevention method of cervical cancer was also found very limited among the students. Although a good number of participants (58.3%) believe that cervical cancer is a preventable disease, very few students were found to be aware about the different methods of prevention. The finding is in concordance with the finding of Akabuike and Ezebialu (2010) as most of their respondent (89.7%) knew that cervical cancer can be prevented. This might be probably attributed to the fact that the respondents in both studies were university students and due to their educational environment, they have gained some conception on it. However, only 31.9% students mentioned vaccination as a preventive method against cervical cancer. A large group of students expressed opinion towards the other preventive methods like medication, regular visit to gynecologist and examination. This could be due to the fact that they had no or very little knowledge about the vaccination and they could not think that a cancer can be prevented by this.

Moreover, the study indicates low willingness to receive the HPV vaccine to prevent the development of cervical cancer from HPV. The study demonstrated that the women in ‘undergraduate level three’ had fine knowledge about “HPV infection causing genital cancer” than the students in lower level. Study also found that knowledge about cervical cancer was higher in the age group 25 and more. The data infer that more attention should be given to educating the younger women.

In regard to the source of information, it observed that the highest number of respondents

received information about cervical cancer from their husband, relatives and friends. However, a considerable number of participants named newspapers and social media as source of information. This matched with the finding of a study in Hong Kong where they observed the respondents mainly received information from mass media (Lee et al., 2014). Media can play vital role in educating women regarding cervical cancer as medias like radio and TV are nowadays available in different corner of the country where information can simply reach to the mass population without any additional cost. On the other hand, a study done in Kenya reported that the main sources of information were health care providers (Gichangi et al., 2003), and in Addis Ababa, the main source of information was health institutions (Terefe and Gaym, 2008). Professional information from health care providers and media would be more valid than information from general people like friends and relatives as they might not have enough knowledge on it. Therefore, it can be stated that in developing countries like Bangladesh, along with media, health-care providers should provide information to the women attending the hospitals/clinics, to increase knowledge, awareness on cervical cancer, risk factors, and seriousness of PAP smear test as the preventive strategy in early diagnosis. Cost-effective means of cervical screening like visual inspection of the cervix after application of 3-5 percent of acetic acid (VIA) or Lugol's iodine (VILI) was introduced in Nigeria (Udokanma & Ogbalu, 2016) and similar programs might also be introduced in other developing countries.

The strength of this study is the participants from different religions of Chattogram district, different age and different academic level and this study also supports the findings of previous studies in respect to the public's knowledge and attitudes to HPV and the vaccination. However, some shortcomings of the study should be accounted are: (i) The

study could not take more participants due to time constraint and limited budget (ii) there might be some selection bias due to following the convenient sampling method.

The study showed that there was low knowledge on cervical cancer and screening for premalignant lesion among women. There is a need to promote and encourage women to early cervical cancer screening at precancerous stage by informing their susceptibility to cervical cancer.

6. Conclusion

Female students at university level were found to have insufficient knowledge about the causal agent of cervical cancer, as well as risk factors and prevention practices. Although women know that cervical cancer is preventable, most of them have no idea on screening tests for early detecting the cancer. Moreover, they were unaware of available vaccine for the cervical cancer. This knowledge gap needs bridging through conducting health camp in academic institutes. This therefore shows the need for education of the female students across different levels of education on the cause of cervical cancer and the greater use of opportunistic screening approach by physicians should be intensified.

7. Recommendations

1. Awareness program should be undertaken targeting the women of reproductive age.
2. Socio-epidemiological risk factors should be identified to formulate effective prevention strategies.
3. Extended KAP (Knowledge, attitude, and practice) studies should be conducted throughout the country to gather more baseline information.

8. Reference

- botchie PN, and Shokar NK. 2009. Cervical cancer screening among college students in Ghana: knowledge and health beliefs. *International Journal of Gynaecology and Cancer* 19, 412-6.
- Abiodun OA, Fatungase OK, & Olu-Abiodun O. 2014. Knowledge, perception and predictors of uptake of cervical screening among rural Nigerian women. *JPHE* 2014; 6(3):119-124.
- Al-Darwish AA, Al-Naim AF, Al-Mulhim KS, Al-Otaibi NK, Morsi MS, Aleem AM. 2014. Knowledge about cervical cancer early warning signs and symptoms, risk factors and vaccination among students at a medical school in Al-Ahsa, Kingdom of Saudi Arabia. *Asian Pacific Journal of Cancer Prevention*. 15, 2529-32
- Anorlu RI. 2008. Cervical cancer: the sub-Saharan African perspective. *Reprod Health Matters* 16, 41-9.
- Bingham A, Bishop A, Coffey P, Winkler J, Bradley J, Dzuba I, Agurto I. 2003. Factors affecting utilization of cervical cancer prevention services in low-resource settings. *Salud Publica Mex* 45 Suppl 3, S408-16.
- Begum R, Shuayb M. 2016. Knowledge about Carcinoma Cervix among the Females of Reproductive Age Group in Selected Urban Communities in Bangladesh. *Advice to Cancer Prevention*. 1:114. doi:10.4172/2472-0429.1000114

- Binka C, Nyarko SH, Doku DT. (2016) Cervical Cancer Knowledge, Perceptions and Screening Behaviour Among Female University Students in Ghana. *J Cancer Educ* 31, 322-7.
- Bostick, R.M., Sprafka, J.M., Virnig, B.A. and Potter, J.D. (1993) Knowledge, attitudes, and personal practices regarding prevention and early detection of cancer. *Prev Med* 22, 65-85
- Bosch FX, Muñoz N, Sanjosé Sd, Izarzugaza I, Gili M, Viladiu P, et al. 2006. Risk factors for cervical cancer in Colombia and Spain. *International Journal of Cancer* 52, 18 JUL 2006
- Can H, Erdem O, Oztekin C, Celik SB, Onde M, Celepkolu T, Ongel K. 2014. Are primary health care workers aware of cervical cancer risk? *Asian Pacific Journal of Cancer Prevention*. 15, 6669-71.
- Chinaka CC, and Udejah VN. 2012. Awareness of cervical cancer and cervical cancer screening among women visiting Federal Teaching Hospital Abakaliki, Nigeria. *Journal of medical and Applied Biosciences*, 4, 48-62.
- Coronado Interis E, Anakwenze CP, Aung M, Jolly PE. 2015. Increasing Cervical Cancer Awareness and Screening in Jamaica: Effectiveness of a Theory-Based Educational Intervention. *Int J Environ Res Public Health* 13, ijerph13010053
- Colon-Lopez V, Ortiz AP, Perez N, Acevedo E, Tamayo V, Zorrilla CD. 2016. Measuring Knowledge of Cancer Screening and Prevention Strategies in HIV Healthcare Professionals. *P R Health Science J* 35, 147-53

- Dillman E, Robert KO, Robert O. 2009. Principles of cancer biotherapy (5th ed.). Dordrecht: Springer. p. 149
- Dim CC. 2012. Towards improving cervical cancer screening in Nigeria; A review of the basics of cervical neoplasm and cytology. Nigerian Journal of clinical practice. 15,247-52.
- Do HH, Taylor VM, Burke N, Yasui Y, Schwartz SM, Jackson JC. 2007. Knowledge about cervical cancer risk factors, traditional health beliefs, and Pap testing among Vietnamese American women. J Immigr Minor Health 9, 109-14
- Driscoll SD. 2015. Barriers and facilitators to cervical cancer screening in high incidence populations: A synthesis of qualitative evidence. Women Health, 1-20
- Eze JN, Umeora OU, Obuna JA, Egwuatu VE, Ejikeme BN. 2012. Cervical cancer awareness and cervical screening uptake at the Mater Misericordiae Hospital, Afikpo, Southeast Nigeria. Ann Afr Med 11, 238-43.
- Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. 2012. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. International Journal of Cancer. 136, E359-86.
- Fylan F. 1998. Screening for cervical cancer: a review of women's attitudes, knowledge, and behaviour. Brazilian Journal of General Practitioners. 48, 1509-14.

- Gatune JW, Nyamongo IK. (2005) An ethnographic study of cervical cancer among women in rural Kenya: is there a folk causal model? *Int J Gynecol Cancer* 15, 1049-59.
- Gawdzik D, Chmaj-Wierzchowska K, Jurczyk MU, Sporny S, Opala T. 2015. Knowledge assessment of women living in the Wielkopolska region concerning risk factors for cervical cancer. *Prz Menopauzalny* 14, 7-12.
- Gichangi P, Estambale B, Bwayo J. 2003. Knowledge and practice about cervical cancer and Pap smear testing among patients at Kenyatta National Hospital, Nairobi, Kenya. *International Journal of Gynecological Cancer Supplement*. 2003;13(6):827–833.
- GoK. 2015. DHIS web report. In: Health (Ed). DHIS2
- Holroyd E, Twinn S, Adab P. 2004. Socio-cultural influences on Chinese women's attendance for cervical screening. *J Adv Nurs* 46, 42-52
- Johnson CE, Mues KE, Mayne SL, Kiblawi AN. 2008. Cervical cancer screening among immigrants and ethnic minorities: a systematic review using the Health Belief Model. *J Low Genit Tract Dis* 12, 232-41
- Kantelhardt EJ, Moelle U, Begoihn M, Addissie A, Trocchi P, Yonas B, et al. 2014. Cervical cancer in Ethiopia: survival of 1,059 patients who received oncologic therapy. *Oncologist* 19, 727-34.

- Kjaer SK, van den Brule AJ, Bock JE, Poll PA, Engholm G, Sherman ME, Walboomers JM, Meijer CJ. 1997. Determinants for genital human papillomavirus (HPV) infection in 1000 randomly chosen young Danish women with normal Pap smear: are there different risk profiles for oncogenic and nononcogenic HPV types? *Cancer Epidemiology Biomarkers Prevention*. 1997 Oct;6(10):799-805. PMID: 9332762.
- Kim K, Yu ES, Chen EH, Kim J, Kaufman, M. Purkiss J. 1999. Cervical cancer screening knowledge and practices among Korean-American women. *Cancer Nurs* 22, 297-302.
- Kress CM, Sharling L, Owen-Smith AA, Desalegn D, Blumberg HM, Goedken J. 2015. Knowledge, attitudes, and practices regarding cervical cancer and screening among Ethiopian health care workers. *Int J Womens Health* 7, 765-72
- Lee A, Ho M, Cheung CKM, Keung VMW. 2014. Factors influencing adolescent girls' decision in initiation for human papillomavirus vaccination: a cross-sectional study in Hong Kong. *BMC Public Health*. 14(1):1–10.
- Lindau ST, Tomori C, Lyons T, Langseth L, Bennett CL, Garcia P. 2002. The association of health literacy with cervical cancer prevention knowledge and health behaviors in a multiethnic cohort of women. *American Journal of Obstetrics and Gynecol* 186, 938-43.
- Maree JE, Kaila I. 2014. Zambian women's experiences and understanding of cervical cancer: a qualitative study. *International Journal of Gynaecology and Cancer*. 24, 1065-71.

- Marlow LA, Waller J, Wardle J. 2007. Public awareness that HPV is a risk factor for cervical cancer. *Brazilian Journal of Cancer* 97, 691-4.
- Mohanty G, Ghosh SN. 2014. Risk factors for cancer of cervix, status of screening and methods for its detection. *Archives of Gynaecology and Obstetrics*. 291, 247-9
- Morema EN, Atieli, HE, Onyango RO, Omondi JH, Ouma C. 2014. Determinants of cervical screening services uptake among 18-49 year old women seeking services at the Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu, Kenya. *BMC Health Survey Research*. 14, 335.
- Mutyaba T, Mmiro FA, Weiderpass E. 2006. Knowledge, attitudes and practices on cervical cancer screening among the medical workers of Mulago Hospital, Uganda. *BMC Medical Education*. 6, 13.
- Mwaka AD, Okello ES, Kiguli J, Rutebemberwa E. 2014. Understanding cervical cancer: an exploration of lay perceptions, beliefs and knowledge about cervical cancer among the Acholi in northern Uganda. *BMC Womens Health* 14, 84.
- Ngugi CW, Boga H, Muigai AW, Wanzala P, Mbithi JN. 2012. Factors affecting uptake of cervical cancer early detection measures among women in Thika, Kenya. *Health Care Women International*. 33, 595-613.
- Nilaweera RI, Perera S, Paranagama N, Anushyanthan AS. 2012. Knowledge and practices on breast and cervical cancer screening methods among female health care workers: a Sri Lankan experience. *Asian Pacific Journal of Cancer Prevention*. 13, 1193-6.

- Nwankwo KC, Aniebue UU, Aguwa EN, Anarado AN, Agunwah, E. 2011. Knowledge attitudes and practices of cervical cancer screening among urban and rural Nigerian women: a call for education and mass screening. *European Journal of Cancer Care (Engl)*. 20, 362-7.
- Oranratanaphan S, Amatyakul P, Iramaneerat K, Srithipayawan S. 2010. Knowledge, attitudes and practices about the Pap smear among medical workers in Naresuan University Hospital, Thailand. *Asian Pacific Journal of Cancer Prevention*. 11, 1727-30.
- Rachana KC, Giri R. 2019. Knowledge regarding cervical cancer among undergraduate female students at a selected college of Lalitpur, Nepal. *Canadian Oncology Nursing Journal*. 29(3):184-188. doi: 10.5737/23688076293184188. PMID: 31966010; PMCID: PMC6970460.
- Rahman H, and Kar S. 2015. Knowledge, attitudes and practice toward cervical cancer screening among Sikkimese nursing staff in India. *Indian J Med Paediatr Oncol* 36, 105-10.
- Raychaudhuri S, and Mandal S. 2012. Socio-demographic and behavioural risk factors for cervical cancer and knowledge, attitude and practice in rural and urban areas of North Bengal, India. *Asian Pac J Cancer Prev* 13, 1093-6.
- Rosser JI, Hamisi S, Njoroge B, Huchko, MJ. 2015a. Barriers to Cervical Cancer Screening in Rural Kenya: Perspectives from a Provider Survey. *J Community Health* 40, 756-61.

- Rosser JI, Njoroge B, Huchko MJ. 2015b. Knowledge about cervical cancer screening and perception of risk among women attending outpatient clinics in rural Kenya. *Int J Gynaecol Obstet* 128, 211-5.
- Shakya S, Karmacharya BM, Afset JE, Bofin A, Asvold BO, Syversen U, Tingulstad S. 2016. Community-Based Health Education has Positive Influence on the Attitude to Cervical Cancer Screening among Women in Rural Nepal. *J Cancer Educ* 31, 547-53.
- Simayi D, Yang L, Li F, Wang YH, Amanguli A, Zhang, W. 2013. Implementing a cervical cancer awareness program in low- income settings in Western China: a community-based locally affordable intervention for risk reduction. *Asian Pacific Journal of Cancer Prevention* 14, 7459-66.
- Tarwireyi F, Chirenje, ZM, Rusakaniko S. 2003. Cancer of the cervix: knowledge, beliefs and screening behaviours of health workers in Mudzi District in Mashonaland East Province, Zimbabwe. *Cent Afr J Med* 49, 83-6.
- Terefe Y, Gaym A. 2008. Knowledge, attitude and practice of screening for carcinoma of the cervix among reproductive health clients at three teaching hospitals, Addis Ababa, Ethiopia. *Ethiopian Journal of Reproductive Health*. 2:14–17.
- Thiel de Bocanegra H, Trinh-Shevrin C, Herrera AP, Gany F. 2009. Mexican immigrant male knowledge and support toward breast and cervical cancer screening. *Journal of Immigrant Minor Health* 11, 326-33.

- Thuler LC, de Aguiar SS, Bergmann A. 2014. Determinants of late stage diagnosis of cervical cancer in Brazil. *Review of Bras Gynaecology and Obstetrics*. 36, 237-43
- Urasa, M. and Darj, E. 2011. Knowledge of cervical cancer and screening practices of nurses at a regional hospital in Tanzania. *Afr Health Sci* 11, 48-57.
- Uysal, A. and Birsal, A. 2009. Knowledge about Cervical Cancer Risk Factors and Pap Testing Behaviour among Turkish Women. *Asian Pacific J Cancer Prev* 10, 345-350.
- Voidazan S, Morariu SH, Tarcea M, Moldovan H, Curticapien I, Dobreanu M. 2016. Human Papillomavirus (HPV) Infection and HPV Vaccination: Assessing the Level of Knowledge among Students of the University of Medicine and Pharmacy of Tirgu Mures, Romania. *Acta Dermato venerology Croatia*. 24, 193-202.
- Udokanma EE & Ogbalu AI. 2016. Knowledge of Risk Factors and Preventive Measures against Cervical Cancer among Feworld male Students of Nnamdi Azikiwe University, Awka. *Nigerian Journal of Health Promotion*, 9, 138-146.
- Wellensiek N, Moodley M, Moodley J. Nkwanyana, N. 2002. Knowledge of cervical cancer screening and use of cervical screening facilities among women from various socioeconomic backgrounds in Durban, Kwazulu Natal, South Africa. *International Journal of Gynaecology Cancer* 12, 376-82.
- Were E, Nyaberi Z, Buziba N. 2011. Perceptions of risk and barriers to cervical cancer screening at Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya. *African Health Science*. 11, 58-64.

- Williams M, Kuffour G, Ekuadzi E, Yeboah M, ElDuah M, Tuffour P. 2013. Assessment of psychological barriers to cervical cancer screening among women in Kumasi, Ghana using a mixed methods approach. *African Health Science*. 13, 1054-61.
- Wongwatcharanukul L, Promthet S, Bradshaw P, Jirapornkul C, Tungsrithong N. 2014. Factors affecting cervical cancer screening uptake by Hmong hilltribe women in Thailand. *Asian Pacific Journal of Cancer Prevention*. 15, 3753-6
- WHO, 2016. Information Centre on HPV and Cervical Cancer. Human Papillomavirus and Related Cancers in Bangladesh. Summary Report 2010.
- WHO. 2006. Comprehensive cervical cancer control: a guide to essential practice.
- Zhang X, Zeng Q, Cai W. 2021. Trends of cervical cancer at global, regional, and national level: data from the Global Burden of Disease study 2019. *BMC Public Health* **21**, 894. <https://doi.org/10.1186/s12889-021-10907-5>
- Yoruk S, Acikgoz A, Ergor G. 2016. Determination of knowledge levels, attitude and behaviors of female university students concerning cervical cancer, human papiloma virus and its vaccine. *BMC Womens Health* 16, 51.

**Knowledge and Attitude Towards Cervical Cancer Among Female Undergraduate
Students in Chattogram, Bangladesh**

ID No:	Date:
Name of student:	College Name:

Serial no	Questions	Coding Category	Description	Code
-----------	-----------	-----------------	-------------	------

Section A: Socio-Demographic questions

1.	Age	Year.....		
2.	What is your academic level?	1. First year 2. Secondary year 3. Third year 4. Fourth year 5. Post graduate		<input style="width: 50px; height: 20px;" type="text"/>
3.	What is your religion?	1. Islam 2. Hindu 3. Buddhist 4. Christian		<input style="width: 50px; height: 20px;" type="text"/>
4.	What is your marital status?	1. Single 2. Having relationship 3. Married 4. Divorced		<input style="width: 50px; height: 20px;" type="text"/>

Section B: General knowledge about cervical cancer

1.	Have you heard about cervical cancer?	1. Yes 2. No		<input style="width: 50px; height: 20px;" type="text"/>
2.	Have you heard about human Papilloma virus?	1. Yes 2. No		<input style="width: 50px; height: 20px;" type="text"/>
3.	Do you know that human Papilloma virus can cause cervical cancer?	1. Yes 2. No		<input style="width: 50px; height: 20px;" type="text"/>

4.	Do you know cervical cancer is preventable?	1.Yes 2.No		<input type="text"/>
5.	Do you know about cervical cancer screening test?	1.Yes 2. No		<input type="text"/>
6.	Can you remember any name of screening test?	1.Yes 2. No		<input type="text"/>
7.	Do you know about available vaccine of cervical cancer?	1.Yes 2. No		<input type="text"/>
8.	Do you know how a woman get cervical cancer?	1. Food habit 2. Unhygienic practices during menstruation 3. Sexual intercourse without condoms 4. Infection of certain organisms 5. Other unhygienic practices		<input type="text"/>
9.	How can it be prevented you think?	1.Taking medicine 2. Routine examination/ screening 3.Vaccination		<input type="text"/>
10.	How did you get to know about cervical cancer?	1.Family members 2.Relatives 3.Freinds 4.Husband 5.Doctor 6.Newspaper 7.Social media 8.Books 9. Others		<input type="text"/>

Section C: Willingness and attitude towards vaccination

1. Do you think vaccine can prevent cervical cancer?	1. Yes 2. No		<input type="text"/>
2. Is there any vaccine available to prevent cervical cancer?	1. Yes 2. No		<input type="text"/>
3. Will you suggest your friend to take vaccine?	1. Yes 2. No		<input type="text"/>
4. Do you think there would be any adverse effect from the vaccine?	1. Yes 2. No		<input type="text"/>
5. How severe these effects can be?	1. Not risky 2. Some risky 3. Risky 4. Do not know		<input type="text"/>
6. What are these adverse effects?	1. Allergy 2. Ill health 3. Rashes/itching 4. Pain 5. Fever 6. Death 7. Other health problems 8. Do not know		<input type="text"/>

Signature of the numerator

.....

Brief Bio-Data of The Author

DR. Shamanti Muhury passed the Secondary School Certificate Examination in 2002 followed by Higher Secondary Certificate Examination in 2004. She obtained her MBBS Degree in 2011 from the University of Science and Technology Chittagong. Now, she is a candidate for the degree of Masters in Public Health (One Health) under the One Health Institute, CVASU. She has immense interest to continue research on AMR and infectious disease epidemiology through One Health approach.