

Knowledge, Attitude and Practice of Commercial Sex Workers Regarding Cervical Cancer and Its Screening, Daulatdia Brothel, Rajbari District, Bangladesh, 2020-2021

Md. Omar Qayum^{1*}, Mohammad Rashedul Hassan¹, Alden Henderson², Mallick Masum Billah¹, Mehejabin Nurunnahar¹, Samia Afser³, Tahmina Shirin¹

Abstract

Background: Cervical cancer is the second most common cancer in females in Bangladesh. This is caused by Human Papilloma Virus (HPV). Multiple sex partners, HIV infection, smoking, using birth control pills, and having more than three children are risk factors of cervical cancer. Hence, female sex workers have a high prevalence of infection with high risk HPV genotypes which eventually may causes cervical cancer. Unfortunately, the status of knowledge, attitude and practice among female sex workers regarding cervical cancer is mostly unknown. The aim of the study was to assess the knowledge, attitude and practice of women living in Daulatdia brothel regarding cervical cancer and its screening. **Methods:** A cross-sectional knowledge-practice survey was conducted among 400 female sex workers in Daulatdia Brothel, Rajbari District, Bangladesh. The women's total score on knowledge, and practice were categorized as sufficient or insufficient. We calculated frequencies and used binary logistic regression to describe and assess the association between scores and socio-demographic characteristics of respondents. **Results:** Most sex workers (61%) were between 29 to 35 years, married at 13 to 15 years of age, and divorced (91%). Middle aged sex workers were more likely have a VIA test than women in the 29 to 35 years group (18%, OR:5.2; CI: 2.0, 13.5). Less than half of the studied women (40%) had sufficient knowledge regarding cervical cancer and 12% knew that infection by HPV is a risk factor. Respondents with primary and secondary education were more likely to have sufficient knowledge than the illiterate (42%, OR: 1.32; CI: 0.82, 2.12). Practices to prevent cervical cancer were very poor. Nearly all women (99%) would recommend other women to have a VIA test. There were only 7% who had a VIA test and 2% were vaccinated against HPV. Unmarried sex workers were more likely to take action to prevent cervical cancer. Sex workers educated up to the primary level were more likely to have a VIA or other tests than the illiterate sex workers (10%, OR: 1.3; CI: 0.6, 3.2). **Conclusion:** Sex workers in Daulatdia brothel were less knowledgeable about cervical cancer and less likely to have a VIA test and poor practices towards preventing cervical cancer. The sex workers underutilized the VIA test and HPV vaccine.

Keywords: Cervical cancer- KAP- VIA- HPV- sex workers- Brothel

Asian Pac J Cancer Prev, **23** (12), 4085-4092

Introduction

Worldwide 604,000 women were diagnosed with cervical cancer and 304,000 deaths occurred in 2020. Low and middle-income nations account for over 90% of all new cases and fatalities globally in 2020 (Sung et al., 2021). In 2018, the age-standardized incidence rate of cervical cancer in Bangladeshi women was 10.6 per 100,000 women and 5,214 cervical cancer fatalities per year (Bruni et al., 2021). Cervical cancer is a fatal illness when it in the invasive stage and it is the only female genital tract cancer that can be prevented if detected early. The majority of cervical cancer occurrences may be

averted if all women participated in a screening program (Papri et al., 2015).

Cervical cancer starts with epithelial dysplasia and progresses to carcinoma in situ and then invasive carcinoma. Cervical cancer can be treated if detected early, and it has an excellent prognosis and with early treatment, can improve the quality of life. In 1994, Bangladesh adopted the Visual Inspection with Acetic Acid (VIA) test as the primary cervical cancer screening test. Bangladesh is one of the few countries in the world that use the VIA test as the primary screening test on a national level (Primary Health Care based screening program).

Risk factors for cervical cancer include multiple sex

¹Institute of Epidemiology, Disease Control and Research (IEDCR), Mohakhali, Dhaka, Bangladesh. ²CDC, US, Bangladesh.

³University of South Asia, Dhaka, Bangladesh. *For Correspondence: oqayum84@gmail.com

partners, young age of sexual activity, giving birth to more than three children, use of hormonal contraception for 5 years or longer, history of sexually transmitted infections, and smoking (WHO, 2022). While women are aware of cervical cancer, they are less aware of risk factors for cervical cancer, such as sexually transmitted diseases (STDs) (Qayum et al., 2021). The Bangladesh Cervical Cancer Screening Program screens women between 30 to 49 years every three years (WHO, 2013). Since the inception of this cervical cancer screening program, only a few studies have assessed the knowledge, attitude, and behaviour related to cervical cancer and screening. Poor screening of cervical cancer was prevalent in both urban and rural areas and the percentage of women up taking or utilizing VIA test was also poor (30%) (Qayum et al., 2021).

Cervical cancer cases rates begin to rise among women aged 20 to 29 years, peak among those aged 55 to 64 years, and then decline among those aged 65 years and older (Srivastava et al., 2018). Bangladesh's Ministry of Health has launched the Human Papilloma Virus (HPV) vaccination with the help of Global Alliance for Vaccines and Immunizations (GAVI). Girls are vaccinated against HPV between the ages of 9 and 13 years old, according to WHO recommendations. Bangladesh tested a school-based immunization program in which 10 year old girls were immunized in elementary schools in selected Upazilas. Girls who are unable to get vaccinated at school as part of the trial can be vaccinated at community-based EPI clinics. VIA screening is less expensive than smear cytology. According to the studies, VIA is effective in reducing cervical cancer incidence and mortality in underdeveloped nations (Sankaranarayanan et al., 2007).

Sex workers have a greater prevalence of abnormal smears and high-risk HPV (Gitsch et al., 1991). Because of their daily activities, sex workers are more susceptible to sexually transmitted infections (STIs), HPV, and hence cervical cancer. They are at risk of cervical cancer due to lack of knowledge and understanding about cervical cancer prevention strategies. Despite the fact that female sex workers (FSWs) are a well-known high-risk population for HPV infections and there are few HPV intervention programs in the world that target sex workers (Vorsters et al., 2016).

Our research looked at the knowledge, attitudes, and practices of cervical cancer screening among women living in brothels. We also identified obstacles and hurdles sex workers face in preventing cervical cancer. This information can modify the Bangladesh Cervical Cancer Screening Program and improve awareness campaigns in Bangladesh by targeting women who are less likely to receive screening and increase women's knowledge of the risk for cervical cancer and availability of the screening tests.

Material and Methods

We used a cross-sectional KAP survey among sex workers where VIA screening program was ongoing in an adjacent upazila and district level. The outcome was VIA use and the variables were KAP, barriers, and challenges.

Site and population

The Daulatdia brothel of Rajbari district was selected because it was the largest brothel in Bangladesh. Approximately 1,400 sex workers reside in this brothel. The workers prefer to stay in single rooms and each room has one worker for commercial sex work and rest. All buildings were on one floor with 10 to 15 rooms and arranged in clusters. Business hours usually start at 3 pm and end at sunrise of the next morning. The brothel has its own security force and capacity to maintain safety of the workers. Using the Cochran's formula and 95% confidence interval (CI), we calculated the sample size as 400 sex workers. We obtained permission of the brothel leader and administrative authorities to conduct the survey. The survey was done from 10 am to 4 pm daily. Women were recruited systematically by going to every 3rd household and then every room in the household.

Exclusion criteria

We excluded women who lived in Daulatdia brothel area less than three months and those who were not sex workers. If no one was at home, we return the same day and if no one was home at the second visit, the room was excluded from survey. We also excluded those who were not interested in participating or did not give consent to be interviewed.

Data collection tools and analysis

After getting informed consent from the respondents, a face-to-face interview was conducted at their home. We collected age, educational status, monthly expenditure, age at first marriage, number of alive children and parity on a pre-tested questionnaire. Continuous variables were transformed into categorical variables. Based on sociodemographic characteristics and scores of women's knowledge, attitude and practice of the VIA test, we calculated descriptive statistics. The main outcomes were a score of knowledge, attitude, and practice. The survey was conducted in peak time of COVID-19 pandemic in Bangladesh, from late 2020 to early 2021.

The median score was used as a cut-off point between sufficient or insufficient knowledge or practice. Thus a score of 6 or greater indicates "sufficient score" in knowledge and a score of 2 or greater indicates "sufficient score" in practice. For attitude, we did not use the median score as a cut-off point because three attitudes were at 99% and resulted in extreme left-hand skewness of the responses. We reported frequencies for attitude.

The association between women's socio-demographic characteristics and their experience with VIA and the association between respondent's score and socio demographic characteristics was assessed by logistic regression. Stata 14.0 (Stata Corp. 2015. Stata Statistical Software: Release 14. College Station, TX: Stata Crop LP) was used to calculate frequencies and odds ratios.

Consent process

Written informed consent was obtained from respondents after explaining the purposes and procedures of the study with maintaining their full anonymity. Data was kept anonymous. Only the researchers had access

to the data and the data was only used for scientific purpose. The study respected each respondent's freedom to participate and adhered to all research principles pertaining to privacy and confidentiality.

Collaborating partners

Institute of Epidemiology, Disease control and Research (IEDCR), Directorate General of Health Services (DGHS), Bangabandhu Sheikh Mujib Medical University (BSMMU), US Centers for Disease Control and Prevention (US CDC).

Funding

Task Force for Global Health, Inc. provided a grant for this study (NU2GGH001873 , CIO/COUNTRY: CGH, FOA Number: CDC-RFA-GH15-1619).

Results

The response rate was high, because the target sample size: 400 sex workers, were enrolled within 1,300 rooms/ households. The typical sex worker in this study was between 29 to 35 years of age, Muslim, and was married between 13 and 15 years old (Table 1). Most of the sex worker were divorced. Only 7% of the sex worker had a VIA test in their lifetime.

The sex workers of middle age group (36-40 years old) tested VIA more than the younger age group (OR: 5.16; CI: 1.98, 13.47). Education, marital status, age at marriage, parity, or expenditure had no significant association with VIA testing. Over half of the participants (53%) were aware of chronic infections, while 50% of the sex workers were aware of sexually transmitted diseases (Table 3). Half of the participants heard of leucorrhoea, while only a few heard of breast cancer or galactorrea. Sex workers were aware of the link between STDs and other risk factors, although they were unaware of other risk variables.

When it came to information about cervical cancer prevention, 58% of the sex workers recognized that using a condom and getting the HPV vaccine could prevent cervical cancer. The majority of them were unaware of the dangers of having several sexual partners. They had little knowledge about the symptoms of cervical cancer.

In terms of attitudes concerning cervical cancer, 99% of sex workers would advise another woman to take the VIA test and sex workers at risk of cervical cancer plan to take the VIA test. In regard of diseases of women, 87% of the sex workers sought medical attention for these diseases. Most sex workers (86%) use a napkin or towel when menstruating. Only a minority of the sex workers had a VIA test (7%) or received a HPV vaccine (2%).

There was no significant difference in age group of sex worker and knowledge of cervical cancer but age groups 46 to 50 had the highest score (OR: 1.69; CI: 0.79, 3.62). Women with primary and secondary education were more likely to have sufficient knowledge than the illiterate respondents (OR: 1.32; CI: 0.82, 2.12). Half of the workers who were unmarried had sufficient knowledge regarding cervical cancer.

In regards to practice, sex workers aged 41 to 45 years

scored five times higher than the younger age group (OR: 5; CI: 1.83, 13.68). The likelihood of sufficient practice regarding cervical cancer occurred more among unmarried sex workers. Sex workers educated up to primary level were more likely to practice VIA or other tests than the illiterate sex workers (OR: 1.33; CI: 0.55, 3.19).

The major sources of information regarding cervical cancer and screening were NGOs, friends, neighbor or relatives, and doctors (Table 6). No one knew about cervical cancer and its screening from radio (radio not listed in table). Only 1% of the sex workers got information about cervical cancer and its screening from a campaign.

Access to medical care

An NGO health office is located inside the brothel and provides primary and essential medical care but does not provide surgery, routine vaccination, emergency care. There is no government healthcare facilities inside the brothel. If a health emergency occurs, the sex worker

Table 1. Socio Demographic Characteristics of Female Sex Worker of Daulatdia Brothel, Rajbari, Bangladesh, 2021-2022

Socio Demographic Characteristics	N=400	
	n	%
Age (years)		
29-35	245	60
36-40	50	13
41-45	32	8
46-50	30	8
51-58	43	11
Education		
Illiterate/draw sign	144	36
Primary	111	28
Secondary/higher than secondary	145	36
Religion		
Muslim	392	98
Hindu	8	2
Marital Status		
Unmarried	22	6
Divorced/Separated	365	91
Widow	13	3
Age at first marriage (years)		
13-15	301	75
15+	99	25
Parity		
0-2	341	85
3+	59	15
Expenditure (Taka/month)		
10,000-16,000	302	75
17,000-22,000	98	25
Undergo VIA Test		
No	372	93
Yes	28	7

Table 2. Association between Female Sex Worker's Socio Demographic Characteristics and VIA Screening, Daulatdia Brothel, Rajbari, Bangladesh, 2021-2022

Socio-demographic Characteristics	Number of respondents (n)	Undergo VIA test n (%)	OR (95% CI)	P value
Age (years)				
29-35	245	10 (4)	Ref	
36-40	50	9 (18)	5.16 (1.98, 13.47)	0.001
41-45	32	4 (13)	3.36 (0.99, 11.42)	0.05
46-50	30	4 (13)	3.62 (1.06, 12.35)	0.04
51-58	43	1 (2)	0.56 (0.07, 4.49)	0.59
Education				
Illiterate/draw sign	144	9 (6)	Ref	
Primary	111	10 (9)	1.49 (0.58, 3.79)	0.41
Secondary and above	145	9 (6)	0.99 (0.38, 2.58)	0.99
Age at first marriage (years)				
13-15	301	22 (7)	Ref	
15+	99	6 (6)	0.82 (0.32, 2.08)	0.67
Parity				
0-2	341	21 (6)	Ref	
3+	59	7 (12)	2.05 (0.83, 5.07)	0.12
Expenditure (Taka/month)				
10,000-16,000	302	18 (6)	Ref	
17,000-22,000	98	10 (10)	1.79 (0.8, 4.03)	0.16

Table 3 Absolute and Relative Number of Female Sex Worker's Answer Claiming to have Knowledge, attitude and Practice Regarding Cervical Cancer, Daulatdia Brothel, Rajbari, Bangladesh, 2021-2022

Characteristic	N=400	
	Yes,n	%
Knowledge about diseases		
Chronic infections	212	53
Sexually transmitted infections	198	50
Leucorrhoea	193	48
Dysmenorrhea	73	18
Breast cancer	23	6
Galactorrea	4	1
Knowledge on risk factors of cervical cancer		
Sexually transmitted disease	259	65
Early marriage	99	25
Multiple sexual partners	91	23
Human Papilloma Virus	48	12
Conceive more than 5 times	30	8
Long term use of contraceptives > 5 years	28	7
Unhygienic condition of cervix	22	6
Habit of using alcohol or substances	13	3
Habit of using tobacco	10	3
Knowledge on prevention of cervical cancer		
Continuous use of condom	232	58
Prevention of chronic infection	148	37
Early marriage	80	20
Avoid of multiple sexual partners	64	16
HPV vaccine use	21	5
Knowledge on symptoms of cervical cancer		
Pain after intercourse	163	41

Table 3. Continued

Characteristic	N=400	
	Yes,n	%
Knowledge on symptoms of cervical cancer		
Foul smelling vaginal discharge	143	36
Bleeding after intercourse	63	16
Heaviness in lower abdomen	62	16
Bleeding after intercourse	56	14
Vaginal bleeding after menopause	14	4
Weight loss	11	3
Knowledge on test and treatments		
Tests for Cervical cancer detection	70	18
Treatment of CA cervix	56	14
Pap test	47	12
VIA as a test for CA cervix	33	8
Colposcopy	12	3
Attitude regarding cervical cancer and screening		
Willingness of nearest female neighbors to get VIA test	395	99
Will you advice another women to do a VIA test	394	99
Do you think all women should test VIA	394	99
Do you think you have any risk for cervical cancer	278	70
After knowing risk, will you plan to do VIA test	256	64
Willing to undergo a VIA test in future	243	61
Practice regarding cervical cancer and screening		
Did you seek medical treatment for female disease?	348	87
Do you use napkin or clean cloth during menstruation?	342	86
Have you ever had a VIA test?	28	7
Have you participated in an awareness program regarding Cervical cancer and VIA test?	13	3
Did you ever receive HPV vaccine?	7	2

Table 4. Association between Female Sex Worker's Socio-Demographic Characteristics and Score of Knowledge Regarding Cervical Cancer, Daulatdia Brothel, Rajbari, Bangladesh, 2021-2022

Socio-demographic characteristics	N (%) with score >5 (sufficient knowledge of Cervical Cancer)	OR	95% CI
Age Group (years)			
29-35	90 (36.7)	Ref	
36-40	23 (46)	1.44	0.78 - 2.66
41-45	11 (34.4)	0.89	0.41 - 1.92
46-50	15 (50)	1.69	0.79 - 3.62
51-58	19 (44.2)	1.34	0.7 - 2.58
Education			
Illiterate/draw sign	52 (36.1)	Ref	
Primary	45 (40.5)	1.21	0.73 - 2.01
Secondary/Higher secondary	61 (42.1)	1.32	0.82 - 2.12
Religion			
Muslim	155 (39.5)	Ref	
Hindu	3 (37.5)	0.91	0.21 - 3.85
Marital Status			
Unmarried	11 (50)	Ref	
Divorced/separated	142 (39)	0.64	0.27- 1.52
Widow	5 (39)	0.63	0.15-2.5
Age at first marriage (years)			
13-15	121 (40.2)	Ref	
15+	37 (37.4)	0.88	0.55 - 1.4
Parity			
0-2	135 (39.6)	Ref	
3+	23 (39)	0.96	0.55 - 1.7
Expenditure (Taka/month)			
10,000-16,000	113 (37.4)	Ref	
17,000-22,000	45 (45.9)	1.48	0.93 - 2.34

is transferred to private or upazilla health complex and district hospital. VIA facilities are in upazilla health complex premises. NGOs only provides medical care for conditions that affect their sexual work or income. There was no access for VIA or vaccine in the brothels.

Discussion

Many women in brothels know the major risk factors and preventive steps for cervical cancer. They know the symptoms of STDs and chronic infections but don't know the symptoms of cervical cancer. The women seek medical care for female diseases that affect their sexual work and income. Regarding disease prevention, few ever had a VIA test or received the HPV vaccine but they will tell other women to take VIA test or HPV vaccine and plan to take the VIA test or HPV vaccine in the future. They are aware that STDs and multiple sex partners are risk factors for cervical cancer but know little about other risk factors such as not using condoms. We suspect the low coverage of VIA testing and HPV vaccination is due to no access for the VIA test or HPV vaccine in the brothel. The survey had a high response despite the COVID-19 restrictions regarding movement and gatherings. We attribute this to interviews conducted before working hours and were

done in private areas.

Early detection helps to prevent cervical cancer. Among all tests for cervical cancer, VIA is most common because of its availability and low cost. The Government of Bangladesh started cervical cancer screening in all districts of Bangladesh with the help of United Nations Population Fund and Bangabandhu Sheikh Mujib Medical University. However, only 7.5% women aged 30 to 49 years in Bangladesh undergone a VIA test (Health Bulletin 2019). The VIA testing level was similar for the sex workers in our study.

The main risk factors for cervical cancer are early marriage, sexually transmitted diseases, unhygienic condition of cervix, multiple sex partners, parity above five, and tobacco and alcohol use (Papri et al., 2015). Women who are at risk of cervical cancer with or without symptoms are recommended to have a VIA or Pap smear test. In Bangladesh, all women aged 30 years or above can request VIA screening at government health facilities and some NGOs. In this study only 25% of the sex workers knew that early marriage could be a risk factor of cervical cancer. Only 12% knew that human papilloma virus could be a risk factor for cervical cancer and only 8% knew about VIA screening. These results are lower than studies of South Africa and Iraq where 49% and 37% of

Table 5. Association between Female Sex Worker's Socio-Demographic Characteristics and Score of Practice Regarding Cervical Cancer, Daulatdia Brothel, Rajbari, Bangladesh, 2021-2022

Socio-demographic characteristics	N(%) with score >1 (sufficient practice of CC)	OR	95% CI
Age Group (years)			
29-35	13 (5.3)	Ref	
36-40	10 (20)	4.46	1.83 - 10.87
41-45	7 (21.9)	5	1.83 - 13.68
46-50	3 (10)	1.98	0.53 - 7.4
51-58	1 (2.3)	0.42	0.05 - 3.33
Education			
Illiterate/draw sign	11 (7.6)	Ref	
Primary	11 (9.9)	1.33	0.55 - 3.19
Secondary/higher secondary/more	12 (8.3)	1.09	0.47 - 2.56
Marital Status			
Unmarried	3 (14)	Ref	
Divorced/Separated	30 (8)	0.56	0.16-2.02
Widow	1(8)	0.53	0.05-5.7
Age at first marriage (years)			
13-15	27 (9)	Ref	
15+	7 (7.1)	0.77	0.33 - 1.83
Parity			
0-2	26 (7.6)	Ref	
3+	8 (13.6)	1.9	0.82 - 4.43
Expenditure			
10,000-16,000	22 (7.3)	Ref	
17,000-22,000	12 (12.2)	1.78	0.84 - 3.74

Table 6. Source of Information Regarding Cervical Cancer and Its Screening, Daulatdia Brothel, Rajbari, Bangladesh, 2021-2022

Source of information regarding Cervical Cancer	N=400	
	Yes,n	%
Source of information regarding Cervical Cancer		
NGO	79	20
Friends/Neighbours/Relatives	67	17
Doctor	29	7
Health Workers	22	6
TV	21	5
Nurse	10	3
Internet	8	2
Any Campaign	3	1
Source of information regarding Cervical Cancer Screening		
Doctor		
NGO	24	6
Friends/Neighbours/Relatives	19	5
Nurse	9	2
TV	7	2
Health Workers	5	1
Internet	5	1
Any Campaign	2	1

the respondents had knowledge that HPV causes cervical cancer. This difference may be due to lack of education and inequality of health services in brothel rather than general community women (Hoque and Hoque, 2009; Hwaid, 2013).

Lack of knowledge about the symptoms of cervical cancer is another handicap for the early detection of cervical cancer. When women have some knowledge about this disease they can identify few characteristic of cervical cancer and can access health care. If people have proper knowledge about symptoms of cervical cancer the burden of cervical cancer can be reduced. Less than half (41%) of the sex workers knew that pain after intercourse is a symptom of cervical cancer. Education played an important role in women's knowledge about cervical cancer. Knowledge on cervical cancer increases with increasing level of education. Our study showed that higher educated respondents scored four times higher in knowledge scale than illiterate respondents. Educated women were more likely to have a VIA test than the illiterate women. This is consistent with studies in Maldives and Bangladesh (Basu et al., 2014; Qayum et al., 2021).

Almost all (99%) of the sex worker showed willingness to recommend other women to get a VIA test. They also showed highly positive attitude that they should test VIA. A study in South India reported that most of the participants showed positive attitude towards cervical

cancer (Narayana et al., 2017). Working status influenced the practice of VIA. Working women were more likely to have a VIA test than housewife. This is similar to a study in Chittagong Medical College (Papri et al., 2015). Our study findings showed that the proportion of sex workers vaccinated with HPV vaccine is very low. This finding is similar to the study of Ethiopia where 2% of the respondents had taken HPV vaccine (Aweke et al., 2017, Qayum et al., 2021).

A few respondents knew HPV was a risk factor for cervical cancer. Our study findings showed that only 2% had the HPV vaccine. Knowledge on the HPV vaccine should be increased and that VIA screening is free for any women aged 30 years or above.

We found that the VIA screening and HPV vaccination was underutilized. Education and working status play a remarkable role in increasing knowledge and practice towards cervical cancer. Educated women are more likely to have a VIA test.

One of the most important finding is that sex worker showed positive attitude towards cervical cancer. Women need to know about the risk factors of cervical cancer to prevent this disease. The trend of taking HPV vaccine should also be increased. Campaign or awareness program can play a crucial role in this regards, however was not a major source of information on cervical cancer among sex workers. Women should know the symptoms of cancer for the early detection and treatment. The women know they are at high risk for cervical cancer and have willingness to do VIA test and get HPV vaccine in the future but they need easy access to these services.

Limitations

- Team surveyed only one brothel and results are not representative of all sex workers in Bangladesh.
- Street, hotel, and residency based commercial sex workers were not included in these study.
- Due to confined and restricted area, respondents may speak to other workers about the survey and influence their response.
- The VIA test has low coverage because cervical cancer screening program was not started in brothel. Social stigma prevents them from going outside brothel for screening.

Recommendations

- The VIA test and HPV vaccine should be available for brothel workers, as well as sustainable health services.
- Advocacy for diseases associated with women should be increased among the sex workers.
- Sex workers should be taught about symptoms and risk factors for cervical cancer.

Author Contribution Statement

Md. Omar Qayum: conception, protocol writing, field activities and data collection, monitoring, supervision, analysis, manuscript writing and review, Mohammad Rashedul Hassan: monitoring, supervision, analysis and manuscript review, Mallick Masum Billah: analysis and manuscript review, Alden Henderson: analysis,

manuscript writing and review, Mehejabin Nurunnahar: analysis, manuscript writing, Samia Afser: field activities and data collection, monitoring, supervision, manuscript writing, Tahmina Shirin: manuscript writing and review.

Acknowledgements

We kindly thank TEPHINET, Denise Duran (US CDC), Mona Saraiya (US CDC), FETPB fellows and graduates, all participants, Upazila Health Complex (Rajbari), Dr. Nowroz Afreen, FETPB graduate and Senior Scientific Officer (IEDCR) for technical and scientific assistance, Dr. Sohel Rahman, FETPB graduate for technical assistance, Dr. Rahat Ara Nur, Technical Consultant, UNFPA for survey assistance.

Funding

Funding was provided by Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET) and Centers for Disease Control and Prevention.

Scientific approval

This research study was approved by Institutional Review Board (IRB) of Institute of Epidemiology, Disease Control and Research (IEDCR), Mohakhali, Dhaka, 1212.

Ethical approval

We obtained written consent from every respondent and interviewed them with privacy and data was kept confidential. Ethical approval was obtained from the Institutional Review Board (IRB) of IEDCR (IRB Number: Memo:IEDCR/IRB/30, 10/11/2020).

Data availability

Data is available upon reasonable request to the corresponding author.

Data Registration

This study was not registered in any dataset for clinical trials, guideline or meta-analysis.

Conflict of interest

None.

References

- Aweke YH, Ayanto SY, Ersado TL (2017). Knowledge, attitude and practice for cervical cancer prevention and control among women of childbearing age in Hossana Town, Hadiya zone, Southern Ethiopia: Community-based cross-sectional study. *PLoS One*, **12**, e0181415.
- Basu P, Hassan S, Fileeshia F, et al (2014). Knowledge, attitude and practices of women in maldives related to the risk factors, prevention and early detection of cervical cancer. *Asian Pac J Cancer Prev*, **15**, 6691-5.
- Bruni L, Albero G, Serrano B, et al (2021). Human Papillomavirus and Related Diseases in the World, Summary Report 22 October 2021. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre).
- Gitsch G, Kainz C, Reinthaller A, et al (1991). Cervical neoplasia and human papilloma virus infection in prostitutes.

Genitourin Med, **67**, 478-80.

- Goel A, Gandhi G, Batra S, et al (2005). Visual inspection of the cervix with acetic acid for cervical intraepithelial lesions. *Int J Gynaecol Obstet*, **88**, 25-30.
- Hoque E, Hoque M (2009). Knowledge of and attitude towards cervical cancer among female university students in South Africa. *Southern Afr J Epidemiol Infect*, **24**, 21-4.
- Hwaid AH (2013). Knowledge and awareness of papillomavirus and cervical cancer among college students and health care workers women in Diyala, Iraq. *Sci Rep*, **1**, 221-5.
- McDonnell RJ, McDonnell PM, O'Neill M, et al (1998). Health risk profile of prostitutes in Dublin. *Int J STD AIDS*, **9**, 485-8.
- Narayana G, Suchitra MJ, Sunanda G, et al (2017). Knowledge, attitude, and practice toward cervical cancer among women attending Obstetrics and Gynecology Department: A cross-sectional, hospital-based survey in South India. *Indian J Cancer*, **54**, 481-7.
- Papri FS, Khanam Z, Islam F, et al (2015). Knowledge and awareness about risk factors of cervical cancer, its screening and vaccination among the women attending Chittagong Medical College Hospital. *Chattagram Maa-O-Shishu Hosp Med College J*, **14**, 57-60.
- Paul SB, Tiwary BK, Choudhury APJAUJoS, et al (2011). Studies on the epidemiology of cervical cancer in Southern Assam, **7**, 36-42.
- Qayum MO, Billah MM, Akhter R, et al (2021). Women's knowledge, attitude and practice on cervical cancer and its screening in Dhaka, Bangladesh. *Asian Pac J Cancer Prev*, **22**, 3327-35.
- Sankaranarayanan R, Esmey PO, Rajkumar R, et al (2007). Effect of visual screening on cervical cancer incidence and mortality in Tamil Nadu, India: a cluster-randomised trial. *Lancet*, **370**, 398-406.
- Srivastava AN, Misra JS, Srivastava S, et al (2018). Cervical cancer screening in rural India: Status & current concepts. *Indian J Med Res*, **148**, 687-96.
- Sung H, Ferlay J, Siegel RL, et al (2021). Global cancer statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin*, **71**, 209-49.
- Vorsters A, Cornelissen T, Leuridan E, et al (2016). Prevalence of high-risk human papillomavirus and abnormal pap smears in female sex workers compared to the general population in Antwerp, Belgium. *BMC Public Health*, **16**, 477.
- WHO (2013). WHO guidelines for screening and treatment of precancerous lesions for cervical cancer prevention, Geneva, World Health Organization.
- WHO (2022). National Strategy for Cervical Cancer Prevention and Control in Bangladesh, 2017-2022. <https://www.who.int/bangladesh/news/detail/24-09-2017-national-strategy-for-cervical-cancer-prevention-and-control-in-bangladesh-2017-2022>.



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.