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Research Article

Sociodemographic and behavioral risk factors for cervical cancer, its awareness and preventive practices among reproductive age group women in a slum area of Kolkata

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Abstract

Background and objectives: Women residing in Indian slums remain at risk of developing cervical cancer because of lack of awareness and effective screening programs. This study aimed at identifying sociodemographic and behavioral risk factors for cervical cancer, its awareness, and preventive practices among reproductive age-group women in a slum of Kolkata.

Materials and methods: A descriptive, observational study with cross-sectional design, was conducted among women of age group 15 - 49 years residing in a slum area. A predesigned, pretested and semi-structured schedule was employed to obtain data from the study participants. Questionaire contained domains of sociodemographic characteristics, awareness regarding cervical cancer, behavioral risk factors and preventive practices. Data was analyzed using appropriate statistical tests and association of sociodemographic characteristics with awareness was assessed using binary logistic regression.

Results: A total of 215 women were enrolled in the study and 62.8% were married and majority (61.8%) had secondary school and above level of education. Nearly 77% participants did not prefer to use barrier contraceptive methods and 8% had a history of unsafe abortion. Majority (76.3%) were unaware of cervical cancer. Out of 51 (23.7%) participants who were aware of the cervical caner, only 9.8% and 17.6% of the them could correctly identify the risk factors and signs and symptoms of cervical cancer respectively. Only 2 (3.9%) and 11 (21.5%) had heard about the screening methods and vaccine for the prevention of cervical cancer respectively.

Conclusion: Extensive health promotion and educational campaigns are required to generate awareness against cervical cancer in under privileged community.

Introduction

Global Cancer Observatory 2020 (GLOBOCAN 2020) estimated that cervical cancer is the fourth most common cancer in women worldwide [1]. In 2020, cervical cancer caused an estimated 604,127 cases and 341,831 deaths worldwide. About 96922 women are diagnosed with cervical cancer annually in India with an annual death rate of 60078 [2].

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Indian has high age-standardised rate (ASR) of incidence of cervical cancer with 12.1 cases per 100,000 women in 2016 [3]. Cervical cancer is the commonest genital tract cancer, especially among women residing in developing countries. In response to this situation, the World Health Organization (WHO) launched a global strategy to accelerate the elimination of cervical cancer in November 2020 during the 73rd World Health Assembly. WHO's key objectives for 2030 are to achieving 90% human papillomavirus (HPV) vaccination coverage for girls, 70% screening coverage, and 90% access to treatment of precancerous and cancerous lesions [4].

The low and middle income countries like India, have no guidelines for screening of cervical cancer. Mass immunization with human papillomavirus (HPV) vaccine is a major strategy for prevention of this cancer [5]. Despite the usefulness of cervical cancer vaccines, significant gaps still exist in the level of awareness and acceptability of the vaccine among women. The known risk factors for cervical cancer include infection with HPV types 16 and 18, poor socio-economic status, smoking, early age of marriage, early age of coitus, presence of multiple sex partners, and multiparity. Women residing in slum areas lack awareness regarding cervical cancer due to absence of effective implementation of screening and vaccination programs. The assessment of awareness, behavioral risk factors along with the sociodemographic profile of women is of utmost importance to plan appropriate measures for the prevention and control of cervical cancer including the introduction of appropriate and effective screening and vaccination programs. With this background, the current study was conducted to find out the awareness, and preventive practices regarding cervical cancer among reproductive age-group women in a slum of Kolkata.

Materials and methods

Study type, place and population: A descriptive, observational study with cross-sectional design, was conducted among women belonging to the reproductive age group of 15-49 years [6] residing in a slum area in Chetla, Kolkata, under Kolkata Municipal Corporation (KMC) Ward 81. This slum belonged to the urban field practice area of Institute of Post Graduate Medical Education and Research (IPGME&R) and Seth Sukhlal Karnani Memorial (SSKM) Hospital, Kolkata. The study was conducted for a period of 3 months from March 2023 to May 2023.

Inclusion and exclusion criteria: Those who were present in their homes at the time of data collection and were mentally stable to give interview and provided consent were included in the study, while those who had been diagnosed with any precancerous or malignant lesion of the cervix or other reproductive organs and those who did not give informed written assent or consent for the study were excluded.

Sample size and sampling technique: The sample size (n) was calculated by applying Cochran's formula, which is: $n= Z^2 p(1-p)]/d^2$. Assuming p (prevalence of being aware of cervical cancer) = 20% [7], Z = 95% Confidence Interval (CI), d (absolute precision) = 5%, and after applying a 10% non-response rate, the final sample size obtained was 215. Consecutive sampling technique was employed to achieve the calculated sample size.

Study tools and study technique: A predesigned, pretested and semi-structured schedule was employed to obtain data from the study participants. It contained a mixture of open-ended and semi-open, single and multiple-response questions and was developed in English language. Questionaire contained domains of sociodemographic characteristics, awareness regrading cervical cancer, behavioral risk factors and preventive practices. The schedule was validated for its content by two faculties from the Departments of Community Medicine and one faculty from Department of Obstetrics and Gynaecology of the institution and necessary changes were incorporated before pretesting it. The schedule was translated into local languages (Bengali and Hindi) by respective language experts (one for each language), and then retranslated back to ensure validity. Pretesting of the schedule was done on 20 reproductive age group women residing in the study setting, who were not included in the final sample. House-to-house visits were done during the data collection period and data were collected by face-to-face interviews and by review

of records from all the eligible participants present in the household.

The study participants were considered 'aware' of the risk factors, along with the signs and symptoms of cervical cancer only if they could correctly answer at least two out of all the questions asked in each domain. The participants were considered aware of the screening methods for cervical cancer only if they could correctly answer at least one out of all the questions asked regarding the same.

Statistical analysis: Data were tabulated in Microsoft Office Excel 2021 and analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0. Armonk, NY: IBM Corp. 2017. Categorical data were represented using mean (± SD) and frequency (percentage). Multivariable binary logistic regression analysis was performed to identify any associations between the sociodemographic characteristics of the study subjects with their awareness of cervical cancer. All the variables having a p-value < 0.2 in the univariate logistic regression were considered biologically plausible and included in the multivariable model to check for model fitness, after checking for multi-co-linearity (variance inflation factor > 10 and tolerance <0.1). A p-value of <0.05 at 95% Confidence Interval (CI) was taken as statistically significant.

Ethical considerations*:* The study was approved by the Institutional Ethics Committee (IEC) of IPGME&R and SSKM Hospital, Kolkata (IPGME&R/ IEC/2023/440). Informed written consent and assent were obtained from the study participants. Anonymity and confidentiality of the data were maintained throughout the study period.

Results

A total of 215 participants were enrolled in the study. Almost half of the participants (49.7%) belonged to the age 20-30 years with the mean age being 25.2 (±6.7) years. Most of the participants (95.3%) followed Hinduism, 62.8% were married, 82.8% were either students or housewives and 53% belonged to 'Upper-lower' (Class IV) socioeconomic status according to the Modified B.G. Prasad Socioeconomic Status scale, updated in 2022 [8]. Nearly 18% had attained menarche below 12 years of age and 84.2% of respondents had history of cancer in the family, out of which 2 (0.9%) had a history of cervical cancer. Detail sociodemographic characterstics of the study particiant is shown in Table-1.

Table-1: *Distribution of study participants according to their sociodemographic characteristics (n= 215)*

Variable	Number(%)
Age-group of the study participants	
15-19	54 (25.1)
20-30	107 (49.7)
31-49	54 (25.1)
Religion	
Hindu	205 (95.3)
Others (Christian/Muslim/Buddhist/Sikh)	10 (4.7)
Caste	
General	153 (71.2)
Others (SC/ST/ OBC)	62 (28.8)
Education	
Illiterate	8 (3.7)
Primary and Middle school	74 (34.4)
Secondary school and above	133 (61.8)
Occupation	
Employed	31 (14.4)
Unemployed	6 (2.8)
Others (housewives and students)	178 (82.8)
Socioeconomic status*	
Class I (Upper)	4 (1.8)
Class II (Upper middle)	23 (10.6)
Class III (Middle)	67 (31.1)
Class IV (Upper lower)	114 (53)
Class V (Lower)	7 (3.2)
Marital Status	
Married	135 (62.8)
Unmarried	77 (35.8)
Others	3 (1.4)
Age at menarche (in completed years)	
9-11	39 (18.1)
≥12	176 (81.8)
History of any cancer in the family	
Present	181 (84.2)
Absent	34 (15.8)

*Note: *As per Modified B.G. Prasad Scale, 2022; SC: Scheduled Caste, ST: Scheduled Tribe, OBC: Other Backward Class*

Table-2: *Distribution of study participants according to their behavioral risk factors for cervical cancer*

Sl. No.	Behavioral Risk Factors	Number (%)
A.	**Age at marriage in completed years (n= 135)**	
1.	<16	15 (11.1)
2.	≥16	120 (88.9)
B.	**Presence of multiple sex partners (n= 215)**	
1.	Yes	4 (1.9)
2.	No	211 (98.1)
C.	**Use of condoms during sexual intercourse (n = 138)**	
1.	Yes	31 (22.5)
2.	No	107 (77.5)
D.	**History of abortion (n=215)**	
1.	Yes	17 (7.9)
2.	No	198 (92.1)
E.	**Addiction to any form of tobacco (n= 215)**	
1.	Yes	16 (7.4)
2.	No	199 (92.6)
F.	**History of white discharge per vagina (n=215)**	
1.	Yes	75 (34.9)
2.	No	140 (65.1)
G.	**Menstrual hygiene**	
1.	Use of sanitary napkins (n= 215)	
i)	Yes	196 (91.2)
ii)	No	19 (8.8)
2.	Frequency of changing the used napkins (n = 196)	
i)	≤ 6 hours	44 (22.4)
ii)	>6 hours	152 (77.6)
3.	Reuse of the material if using cloth (n = 19)	
i)	Yes	16 (84.2)
ii)	No	3 (15.8)
H.	**Cleaning of intimate areas during bathing (always), n= 215**	
1.	Yes	214 (99.5)
2.	No	1 (0.5)
I.	**Cleaning of intimate areas after sexual intercourse (always), n= 215**	
1.	Yes	175 (81.4)
2.	No	40 (18.6)

Distribution of study participants according to their behavioral risk factors for cervical cancer is shownin Table-2. The age at marriage was < 16 completed years in 11.1% of the respondents and 138 (64.2%) participants had history of sexual intercourse, out of which only 22.3% preferred barrier methods (condoms) during intercourse. Only 4 (1.8%) of the study subjects had multiple sex partners. Nearly 35% of the participants reported white discharge per vagina, however, among them, 27.4% underwent treatment for the condition. Of the total participants, 91.2% used sanitary napkins during menstruation, but only 22.4% would change the napkin within 6 hours of using it. Among those who used clothes during menstruation, 84.2% would reuse them. Though almost all except 1 respondent cleaned their intimate areas during bathing, 18.6% did not clean their intimate areas after intercourse.

A majority (164/76.3%) of the participants had not heard about cervical cancer at all. Among those

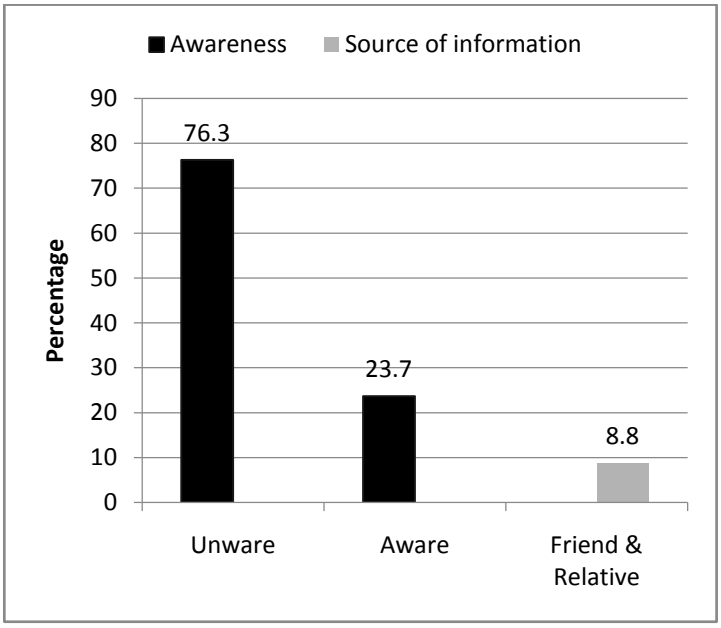

Figure-1: *Level of awareness regarding cervical cancer among the study participants (n=215)*

who had heard (51/23.7%), the most commonly reported source of information was friends and relatives (8.8%) [Figure-1].

Out of 51 participants who were aware of the cervical cancer, only 5 (9.8%) and 9 (17.6%) of the them could correctly identify the risk factors and signs and symptoms of cervical cancer respectively. Only 2 (3.9%) had heard about the screening methods for early detection of cervical cancer, while only 11 (21.5%) could correctly respond about any vaccine for the prevention of cervical cancer (Table-3).

Among those who could correctly identify the risk factors, the most commonly identified risk factor was unhygienic practices, while among those who could correctly identify the signs and symptoms of cervical cancer, lower abdominal pain was the most commonly recognized symptom, followed by smelly white vaginal discharge and heavy menstrual bleeding. Only 2 (0.9%) participants had been screened for cervical cancer, but none had received the HPV vaccine. Table-4 shows multivariable binary logistic regression of awareness of study participants regarding cervical cancer on sociodemographic characteristics. Participants of

Table-3: *Level of awareness of the study participants regarding cervical cancer (n=51)*

Questions asked	**Correct responses n (%)**	**Incorrect responses n (%)**
1. "Are you aware of the risk factors for cervical cancer?"	5 (9.8)	46 (90.2)
2. "Are you aware of any infection causing cervical cancer?"	12 (23.5)	39 (76.5)
3. "Are you aware of the signs and symptoms for cervical cancer?"	9 (17.6)	42 (82.4)
4. "Are you aware whether cervical cancer is preventable or not?"	15 (29.4)	36 (70.6)
5. "Are you aware of any screening methods for early detection of cervical cancer?"	2 (3.9)	49 (96.1)
6. "Are you aware of any vaccines for the prevention of cervical cancer?"	11 (21.5)	40 (78.5)

age group 20-30 years (aOR 0.82, 95% CI 0.30-2.23; p = 0.007), married (aOR 0.24, 95% CI 0.01-3.18; p = 0.021) and those with a family history of any cancer (aOR 0.31, 95% CI 0.13-0.78; p = 0.012), had statistically significant lower odds of being unaware of cervical cancer, as compared to participants of other age-groups, those who were unmarried/divorced and those without a family history of any cancer respectively.

Table-4: *Multivariable binary logistic regression showing the association of sociodemographic characteristics of study participants with their awareness of cervical cancer (n=215)*

Sociodemographic characteristics	Being unaware of cervical cancer (n= 164)		
	Number (%)	aOR (95% CI)	p-value
Age-group of the study participants (in completed years)			
15-19	40 (24.8)	1.22 (0.39-3.81)	0.721
20-30	78 (48.4)	0.82 (0.30-2.23)	**0.007**
≥ 31	43 (26.8)	Ref.	-
Marital status			
Married	115 (71.4)	0.24 (0.01-3.18)	**0.021**
Unmarried	48 (28.0)	0.96 (0.07-3.12)	0.975
Divorced/ separated/ widow	1 (0.6)	Ref.	-
Family history of any cancer			
Yes	20 (12.4)	0.31 (0.13-0.78)	**0.012**
No	141 (87.6)	Ref.	
Highest level of education attained by the participants			
Illiterate	7 (4.3)	0.60 (0.06-5.49)	0.657
Primary and Middle school	61 (37.9)	0.56 (0.26-1.22)	0.149
Secondary and above	93 (57.8)	Ref.	-

*Note: Ref. Cat=being aware of cervical cancer; **Model fitness**: Cox and Snell R-square=0.104, Nagelkerke R-square=0.153, Omnibus Test was significant (p<0.001) but Hosmer-Lemeshow Test was not significant (p=0.975)*

Discussion

The present study investigated the sociodemographic and behavioral risk factors for cervical cancer, its awareness, and preventive practices among reproductive age-group women in a slum of Kolkata. The current study found only 23% had awareness of cervical cancer. On the contrary, a study conducted by Saha A *et. al* in Kolkata [9], among the elite medical colleges of the city, reported level of awareness as 43% about cervical cancer. This contrast in level of awareness could be due to lack of effective health education and communication and awareness programs and implementation of policies for generating awareness in poor resource settings like slum areas regarding cervical cancer.

A study was conducted by Bevilacqua KG *et al* in Guatemala [10], wherein 80% of women had reported having ever been screened for cervical cancer. On the other hand, the present study revealed that none of the study participants had been screened for cervical cancer. In both the studies, poor personal hygiene or a lack of personal care was identified as the most common risk factor for cervical cancer. The findings points towards the absence of effective screening and vaccination programmes in the study area, along with lack of proper health education campaigns and programmes by the healthcare workers in creating awareness on the importance of maintaining personal hygiene in preventing cervical cancer in the community.

In the current study, the participants responded that no screening services for cervical cancer were available in their nearby healthcare facilities. Whereas in a study conducted by Kaur S *et al* [11]

in India, nearly half of the participants agreed that there were screening facilities in the nearby healthcare centers. This sheds light into the unavailability of adequate screening, diagnostic and treatment services in the nearby healthcare facility in the current study area, which also exposes the disparities in healthcare access in relation to cervical cancer across the country.

In a study done by Blödt *et al* in Berlin [12], which included both men and women belonging to the 18-25 years age group, 51% of women and 42% of men thought that only women could be infected with HPV and the majority did not know that HPV is sexually transmitted. In the same study, 40% of women had been vaccinated with the HPV vaccine. Also, in the multivariable analyses in the study, education, and past sexual intercourse remained borderline significant predictors of vaccine uptake. This is in contrast to the current study, which recruited only reproductive age group women, where the majority were unaware of cervical cancer, including its risk factors, causes, signs, symptoms, and none of them had received the HPV vaccine. Multivariable analyses in the current study revealed that the age of respondents, marital status and family history of cancer had statistically significant associations with their awareness of cervical cancer. The unvaccinated status of women in the present study highlights the need for developing adequate screening and vaccination facilities in the nearby healthcare centres.

The current study revealed that majority of respondents were unaware of cervical cancer, and 21.5% could correctly respond about any vaccine for preventing cervical cancer. This is similar to a study conducted by Rančić *et al* [13] among female students from Serbia, where the awareness about HPV and the HPV vaccine was low, i.e., only 14.2% of the students had heard about both HPV and its vaccine. In the same study, the most commonly reported source of information regarding cervical cancer was social media, whereas, in the current study, the most common source of information regarding cervical cancer was friends and relatives.

According to a study conducted by Khanna in Varanasi, India [14] where all study subjects belonged to the rural areas, the majority knew about cervical cancer as a type of cancer in women. Very few of them could name any screening method or a vaccine that could prevent cervical cancer. The major source of information on cervical cancer was family and friends. In the current study, which recruited women residing in a slum in Kolkata, with majority being unaware of cervical cancer and very few study subjects could name any screening method or vaccine for prevention of cervical cancer. In this study, the major source of information on cervical cancer was friends and relatives. This difference in knowledge on cervical cancer could be due to lack of adequate and uniform health education programmes and campaigns on cervical cancer across the country.

A systematic review by Taneja *et al* [15] in 2021 revealed overall knowledge on cervical cancer among Indian women as 40.2%. In the present study, 76.3% of the participants did not hear about cervical cancer at all. A study in Nigeria by Olubodun *et al* [16] among women residing in urban slums, reported low level of knowledge about cervical cancer, its screening and HPV immunization. The finding is similar to our study, which was also conducted among reproductive age group women in an urban slum, where majority lacked knowledge of cervical cancer, its screening and vaccination services. This highlights the need for increased mass campaigns in the community for promoting awareness about cervical cancer and its causes, risk factors and the importance of preventive measures. Public education campaigns can help dispel myths and misconceptions surrounding the disease and encourage women in low and middle income countries like India, to seek screening and vaccination services.

A study conducted by Jones *et al* [17] in India, revealed 14.22% of respondents in the overall group and 14.39% in the priority screening group, reported receiving a prior cancer screening. Among women who had not received cancer screening, the most common reasons were "no provider recommendation" (42.18%) and not knowing they needed to be screened (40.76%). Another study conducted by Nilima *et al* [18] in India in 2022, revealed that older women had 1.16 times the odds of getting screened for cervical cancer as compared to their younger counterpart. The odds of cervical cancer screening among the women in richest

wealth quintile was 2.5 times compared to the poorest. Those who are aware of STDs (Sexually Transmitted Diseases) have 1.39 times the odds of getting screened for cervical cancer. Wealth index, years of schooling, and religion have a substantial indirect and total impact on the screening. The present study reported that 76.3% of the participants had not heard about cervical cancer at all. Very few participants had been screened for cervical cancer but none of them had received the HPV vaccine. This focusses the need to implement policies regarding adequate diagnostic and treatment modalities to reduce the burden of cervical cancer among women in the low and middle-income countries like India.

Present study had some limitations. The current study was conducted in only one slum area of Kolkata, hence it might not represent the overall awareness level of cervical cancer or behavioral risk factors and preventive practices of all the reproductive age group women, particularly those residing in the rural areas. Also, the study relied upon self-reported data, which might be subjected to social desirability bias.

Overall, the study revealed that most of the women living in slum were unaware of cervical cancer, its risk factors, signs and symptoms. The findings from this study highlight the need for increased mass campaigns in the under privileged community for promoting awareness about the causes, risk factors and preventive practices of cervical cancer. Screening and vaccination facilities for cervical cancer should be made available at the health centers.

Authors contributions

SD: Literature review, concept and study design, critically revising the article for important intellectual content, data analysis, interpretation, and manuscript preparation; SP: Literature review, concept and study design, submission for ethical approval, data collection, data analysis and interpretation, manuscript preparation; AA: Literature review, concept and study design, data analysis and interpretation, critically revising the manuscript; MB: Concept and design of study, statistical analysis and interpretation, critically revising the manuscript.

Conflicts of interest

There are no conflicts of interest.

Fund

Nil.

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