

RESEARCH ARTICLE

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Women's Knowledge on Cervical Cancer Risk Factors and Symptoms: A Cross Sectional Study from Urban India

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Abstract

Background: Early-stage cervical cancer diagnoses may be the consequence of timely medical care in the presence of symptoms which can be linked to awareness of the symptoms and risk factors. This study aims to determine the knowledge about risk factors and symptoms of cervical cancer and associated factors among women aged 20-49 years. **Methods:** Data were utilized from the survey under the intervention “*Increasing access to cervical cancer screening and care through the community-centric continuum of care initiative in India*” (2015). The sample size was 1,020 women in the age group of 20-49 years. Descriptive statistics, along with bivariate analysis, was done to represent the preliminary results. Multivariable regression analysis was used to represent the estimates. **Results:** About 40.1% [Delhi: 56.9% and Rohtak: 20.4%] and 45.5% [Delhi: 52.2% and Rohtak: 37.7%] of respondents had good knowledge about risk factors and symptoms of cervical cancer, respectively. Respondents with primary educational status had an 86% significantly higher likelihood for good knowledge about identified risk factors of cervical cancer [adjusted odds ratio (aOR): 1.86; CI: 1.12-3.10]. Respondents who were married or widowed/divorced/separated had significantly higher odds for good knowledge about identified risk factors and symptoms of cervical cancer in reference to respondents who were never married. Respondents from Rohtak had 72% and 35% significantly higher odds for good knowledge about identified risk factors [aOR:0.28; CI: 0.21,0.39] and symptoms [aOR:0.65; CI: 0.48,0.88] of cervical cancer, respectively, in reference to respondents from Delhi. **Conclusion:** Overall awareness about cervical cancer and Human papillomavirus (HPV) as the causative agent was low, more so in Rohtak. This is extremely worrisome as blocking HPV infection is one of the most effective ways to prevent cervical cancer. Moreover, the knowledge about the risk factors and symptoms of cervical cancer is also inadequate, particularly in women from Rohtak.

Keywords: Cervical cancer- signs and symptoms- risk factors- human papillomavirus

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Introduction

With an estimated 570,000 new cases in 2018, cervical cancer is the fourth most widespread cancer among women worldwide (WHO, 2020). Cervical cancer is commonly referred to as a “disease of disparity” because of the stark disparity in incidence and mortality between low and middle-income countries (LMICs) and high-income countries (HICs) (Vu et al., 2018), with LMICs accounting for over 90 percent of all cervical cancer fatalities globally (WHO, 2020). There are 453.02 million women in India aged 15 and older who are at risk of having cervical cancer. According to current estimates, 96,922 women are diagnosed with cervical cancer each year, with 60078 dying from the disease, implying that one woman dies due to cervical cancer every 8 minutes in India (HPV Factsheet, 2017).

The most frequent histological subtypes of cervical cancer are squamous cell carcinoma and adenocarcinoma,

which account for roughly 70 percent and 25 percent of all cervix malignancies, respectively (Small et al., 2016). Almost all cases of cervical cancer are caused by chronic infection with high-risk oncogenic subtypes of the human papillomavirus (HPV). As a result, risk factors include those associated with acquiring HPV infection, having a severely impaired immune response to HPV infection, or both (International Collaboration of Epidemiological Studies of Cervical Cancer, 2007).

There are various other risk factors associated with cervical cancer around the world (Varghese et al., 1999), including early age at marriage indicating early exposure to sexual activities and early pregnancy, a high-risk sexual partner or multiple sexual partners, history of sexually transmitted infection, immunosuppression (e.g., after organ transplantation or immunodeficiency disorders like Human Immunodeficiency Virus (HIV)), history of HPV-related vulvar or vaginal dysplasia and non-attendance for

screening and under screening in nations with established cervical screening programmes (bringing about an expected two-thirds of cervical cancers in such countries) (Sultana et al., 2014).

Furthermore, there are some symptoms of cervical cancer that a woman should be aware of for timely diagnosis of cervical cancer. Unusual vaginal bleeding and persistent blood-stained or odorous vaginal discharge are the most common symptoms of cervical cancer (Low et al., 2012). Early-stage cervical cancer diagnosis may be the consequence of timely medical care in the presence of symptoms (Kennedy et al., 1989) which can be linked to awareness of the symptoms and risk factors (Simon et al., 2010). However, the level of awareness is often low in developing countries like India exhibiting region-wide differences. Only 33 percent of the women in Puducherry were aware of the risk factors for cervical cancer, whereas 35 percent were aware of symptoms (Siddharthar et al., 2014). Similarly, in another study done in Bhopal, just 35.3 percent and 39.8 percent of participants knew at least one symptom and one risk factor, respectively (Bansal et al., 2015).

Screening for cervical cancer screening is extremely low in India (Sankaranarayanan et al., 2009). The success and advantages of screening at a national public health program to control and prevent cervical cancer are highly dependent on the level of awareness of the beneficiaries. Hence, this study was conducted with the aim to understand the women's knowledge of the risk factors and symptoms related to cervical cancer and to further determine the factors associated with it. This helps in understanding the areas of poor knowledge that could be targeted in the country's health awareness and education programmes. The study hypothesized that there was no significant association between the socio-demographic factors and knowledge about signs & symptoms of cervical cancer among aged 20-49 years.

Materials and Methods

Study design and settings

The present study utilized the data from the cross-sectional survey conducted in 2015 as part of the intervention project "*Increasing access to cervical cancer screening and care through the community-centric continuum of care initiative in India*". The survey was conducted in two urban localities of New Delhi and Rohtak during 2015-17. Palam and adjoining areas of New Delhi and the Gaukaran area in Rohtak were chosen for the survey. The population of Palam and Rohtak as per census 2011 was 0.2 million and 1.06 million, respectively. Rohtak is situated at about 70 kilometers away from the national capital New Delhi. Palam is situated in South West Delhi. The selection has been made considering its access and proximity to the health care facility so that the screening and referrals can be done efficiently. Women of reproductive age group, who are the residents of the selected areas were surveyed. A pre-tested semi-structured tool was used to collect the information.

Outcome variables

There were two outcome variables, i.e., knowledge about cervical cancer risk factors and knowledge about cervical cancer symptoms. The knowledge about risk factors of cervical cancer was assessed using 23 questions, including questions related to preventive lifestyle factors that can reduce the risk of cervical cancer. The summative scale was made using the *egen* command in Stata 14. A score of 0-23 was generated, which was then divided into a poor and good category using the median value (Cronbach's alpha: 0.841). Similarly, 13 questions were used to assess the knowledge about symptoms of cervical cancer (Cronbach's alpha: 0.862). The summative scale was made using the *egen* command in Stata 14. A score of 0-13 was generated, which was then divided into poor and good categories using the median value. The list of questions is attached in the supplementary file.

Explanatory variables

Age was coded as 30 years and less and more than 30 years. Age at marriage was coded as less than 18 years and 18 and above years. Educational status was coded as not educated, primary, secondary and higher. Marital status was coded as never married, married and widowed/divorced/separated. Employment status was coded as not employed and employed. Income was coded into five quintiles (in rupees) 5,000 and less, 5,000-8,000, 8,000-1,0000, 10,000-15,000 and more than 15,000. The survey was conducted in two cities, i.e., Delhi and Rohtak.

Sample estimation

Because there were no credible estimates available at the study location, proxy indicators were used to compute the sample size for the survey. The proxy indicator was chosen with the project's goal in mind, which is to increase cervical cancer literacy. When calculating the sample size, there are two assumptions when using women literacy as the p-value. To begin with, it was expected that literate women would be better able to absorb information concerning cervical cancer. Second, women's literacy is an essential proxy determinant of a society's socioeconomic status. Women's literacy in the Palam areas of south-west Delhi was 88.50 percent, whereas it was 80.2 percent in Rohtak, Haryana. The current study had a sample size of 1020 women aged 20-49 years [Delhi: 550 and Rohtak: 470]. All women aged 20-49 years and who were residents of the selected areas were eligible for the study.

Data collection and management

Data on socio-economic and demographic characteristics along with knowledge of sign and symptoms of cervical cancer was collected using a semi-structured questionnaire. Women were recruited through house visits with the assistance of Anganwadi staff and Helpers at Anganwadi Centres, and data was collected through face-to-face interviews in the local language. The goal and importance of the study were explained to the respondent prior to data collection, and written informed consent was obtained. The Institutional Ethics Committee of MAMTA HIMC provided ethical clearance. To ensure the data's confidentiality, proper

security procedures were used.

Statistical approach

Descriptive statistics, along with bivariate analysis, was done to represent the preliminary results. The Chi-square test was used to test the level of significance during bivariate analysis. Additionally, bivariate logistic regression analysis (Peng et al., 2002) was used to represent the estimates in the form of crude odds ratio (cOR) and adjusted odds ratio (aOR) at a 95% confidence interval. Variance inflation factor (VIF) (Miles, 2014) was estimated to check multi-collinearity between the variables, and it was found that there was no evidence of multi-collinearity between the variables. Stata 14 was used to analyses the results in the present study.

Results

Table S1 represents the socio-economic profile of the study population. Mean age of the respondents was 33.3 years (standard deviation: 7.95). The mean age at marriage was 19.1 years (standard deviation: 2.7).

Figure 1 and Figure 2 revealed the percentage of respondents who identified risk factors and symptoms for cervical cancer, respectively. It was found that about 40.1% and 45.5% of respondents had overall good knowledge about risk factors and symptoms, respectively.

Table 1 revealed percentage distribution and unadjusted binary logistic regression estimates for knowledge about risk factors of cervical cancer by their background characteristics. Higher the age of the

respondents, higher the knowledge about risk factors of cervical cancer among the respondents; however, the association was not significant. Females with age at marriage less than 18 years had good knowledge about the risk factors of cervical cancer (53.5%; p-value: 0.071); however, the association was not significant for state-wise estimates. The share of respondents with good knowledge of risk factors of cervical cancer was low among those who were not educated (35.9%; p-value: 0.003); however, the association was reversed in Delhi (p-value: 0.204), whereas, in Rohtak, the relationship was directly proportional (p-value: 0.013). Widowed/divorced/separated respondents had a higher prevalence of good knowledge of risk factors of cervical cancer (56.3%; p-value: <0.001); moreover, the results were similar for Delhi and Rohtak. Higher the income of the respondent's family, higher the prevalence of good knowledge about risk factors of cervical cancer among them (p<0.001); however, the association was not significant for Delhi and Rohtak separately.

Table 2 revealed the percentage distribution of those who identified symptoms of cervical cancer by their background characteristics. Higher the age of the respondents higher the knowledge about symptoms of cervical cancer among the respondents; however, the association was not significant for Delhi and Rohtak. Females with age at marriage less than 18 years had good knowledge about the symptoms of cervical cancer (52.1%; p-value: 0.071); however, the association was not significant for Rohtak. The share of respondents with good knowledge about symptoms of cervical cancer was

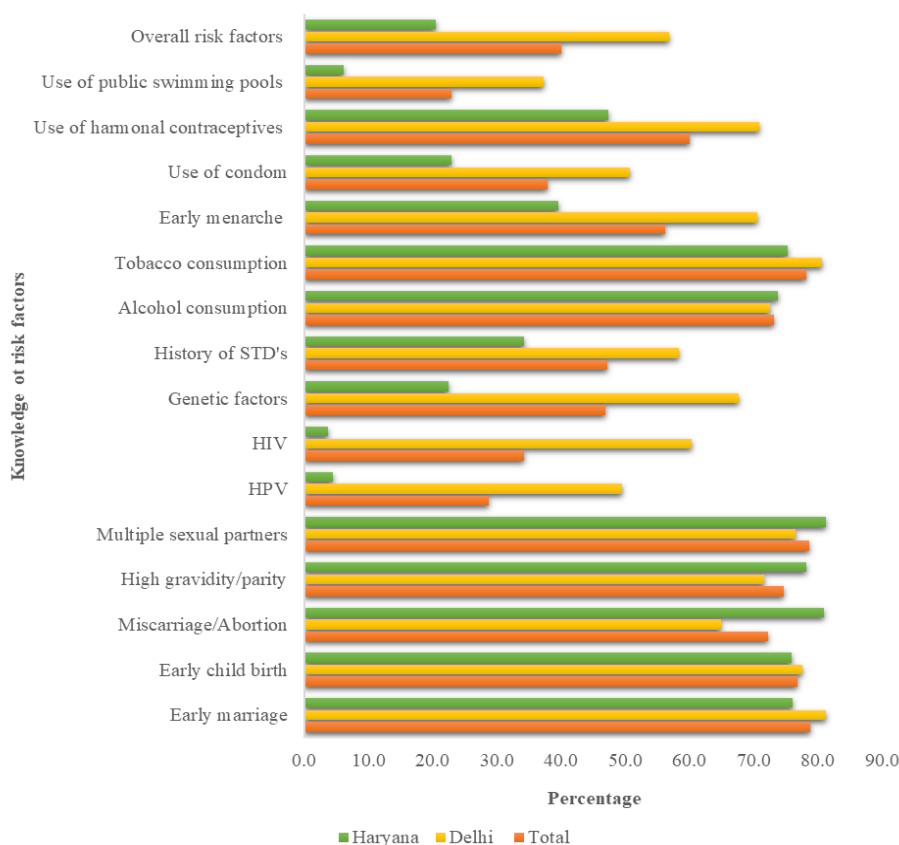


Figure 1. Percentage of Respondents who Identified Risk Factors of Cervical Cancer

Table 1. Percentage Distribution and Unadjusted Binary Logistic Regression Estimates for Knowledge about Risk Factors of Cervical Cancer by their Background Characteristics, (n=1020)

Background characteristics	Total %	cOR (95% CI)	Delhi %	cOR (95% CI)	Rohtak %	cOR (95% CI)
Age (in years)						
30 years and less	47.2	Ref.	63.9	Ref.	31.4	Ref.
More than 30 years	50.1	1.12 (0.88,1.44)	65.6	1.08 (0.75,1.54)	28.7	0.88 (0.59,1.3)
Age at marriage (in years)						
Less than 18	53.6	Ref.	64.6	Ref.	26.3	Ref.
18 and above	47.2	0.77 (0.58,1.02)	65.1	1.02 (0.71,1.48)	30.7	1.24 (0.71,2.16)
Educational status						
Not educated	35.9	Ref.	66.7	Ref.	19.8	Ref.
Primary	57.8	2.45* (1.53,3.93)	67.7	1.05 (0.49,2.21)	43.3	3.1* (1.51,6.35)
Secondary	49.7	1.77* (1.11,2.82)	73.3	1.37 (0.63,2.99)	25.9	1.42 (0.69,2.91)
Higher	48.9	1.71* (1.15,2.54)	61.6	0.8 (0.41,1.55)	31.5	1.86* (1.02,3.39)
Marital status						
Never married	25.4	Ref.	41.4	Ref.	13.2	Ref.
Married	50.2	2.96* (1.68,5.21)	65.9	2.73* (1.28,5.85)	31.5	3.03* (1.16,7.94)
Widowed/Divorced/Separated	56.3	3.78* (1.71,8.35)	72.4	3.72* (1.24,11.17)	31.6	3.05 (0.79,11.74)
Employment Status						
Not employed	48.5	Ref.	65.3	Ref.	29.8	Ref.
Employed	50.7	1.09 (0.76,1.56)	62.8	0.90 (0.56,1.45)	31.5	1.08 (0.59,1.99)
Income (in Rupees)						
5000 and less	33.8	Ref.	55.8	Ref.	28.6	Ref.
5000-8000	40.8	1.35 (0.92,1.97)	60	1.19 (0.57,2.48)	29.1	1.02 (0.63,1.65)
8000-10000	57.6	2.67* (1.83,3.89)	68.7	1.74 (0.87,3.44)	31.4	1.15 (0.63,2.08)
10000-15000	57.6	3.31* (2.17,5.04)	67.9	1.67 (0.83,3.36)	33.3	1.25 (0.5,3.1)
More than 15000	54.8	2.37* (1.56,3.61)	63.1	1.35 (0.66,2.76)	34.8	1.33 (0.67,2.65)
Cities						
Delhi	64.9	Ref.				
Rohtak	30	0.23* (0.18,0.3)				

%, percentage; Ref, Reference; *if p<0.05; cOR, Crude odds ratio; CI, Confidence interval

low among those who were not educated (41.2%; p-value: 0.161). Widowed/divorced/separated respondents had a higher prevalence of good knowledge about symptoms of cervical cancer (47.9%; p-value: <0.014); however, the association was not significant for Delhi. Higher the income of the respondent's family, higher the prevalence of good knowledge about symptoms of cervical cancer among them (p<0.007); however, the association was not significant for Delhi and Rohtak separately.

Table 3 represents the logistic regression estimates for identified risk factors and symptoms of cervical cancer by their background characteristics. The estimates were adjusted for all the background characteristics. Age was not a significant factor for knowledge about risk factors and symptoms among the respondents. Respondents with age at marriage 18 years and above had significantly lower odds for good knowledge about identified symptoms of cervical cancer [adjusted odds ratio (aOR): 0.57; CI: 0.40-0.82]. Respondents with primary educational status had an 86% significantly higher likelihood for good knowledge about identified risk factors of cervical

cancer [aOR: 1.86; CI: 1.12-3.10]. For the respondents with primary, secondary or higher educational status, the odds for good knowledge about identified symptoms of cervical cancer was significantly higher; however, the association was not significant. Respondents who were married or widowed/divorced/separated had significantly higher odds for good knowledge about identified risk factors [(married: aOR: 4.26; CI: 1.96-9.24) (widowed/divorced/separated :5.68; CI: 2.12-15.24)] and symptoms [(married: aOR: 3.02; CI: 1.46-6.24) (widowed/divorced/separated: 3.08; CI: 1.23-7.74)] of cervical cancer in reference to respondents who were never married. Employment status was not significantly associated with good knowledge about identified risk factors and symptoms of cervical cancer among the respondents. Income was also not significantly associated with good knowledge about identified risk factors and symptoms of cervical cancer among the respondents. Respondents from Rohtak had 72% and 35% significantly higher odds for good knowledge about identified risk factors [aOR:0.28; CI: 0.21,0.39] and symptoms [aOR:0.65; CI: 0.48,0.88] of cervical cancer in reference to respondents from Delhi.

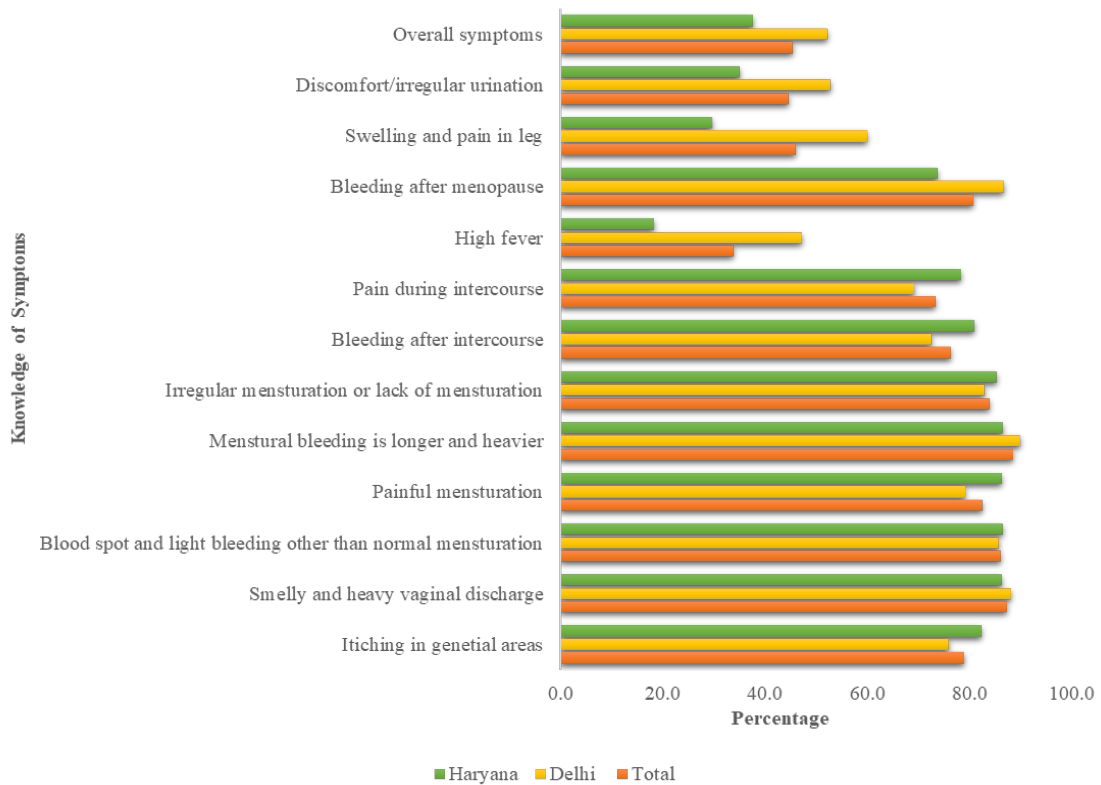


Figure 2. Percentage of Respondents who Identified Symptoms of Cervical Cancer

Discussion

This study provides insights into the knowledge about the risk factors and signs and symptoms of Cervical Cancer among women in Delhi and Rohtak cities of India. The study shows a suboptimal knowledge about risk factors and symptoms of cervical cancer.

Poor awareness and knowledge of cervical malignancy among women have been well documented in diverse ethnic populations from various countries (Abotchie and Shokar, 2009; Wong and Sam, 2010). In the present study, around 54% per cent of the women had heard about cervical cancer, and the numbers were similar in both the cities, which is lower than reported in other studies from India ranging between 60 and 66% and far lower than studies across the globe (Shrestha et al., 2013; Touch and Oh, 2018). The awareness is quite poor in the present settings as compared to studies from other regions of the country. A study among tribal women from Southern India had reported that awareness was as high as 82.9% (Ghosh et al., 2021). Further, the awareness about HPV as a causative agent was poor (28.5%), which was only 3.7% among women in Rohtak as compared to 48.5% women in Delhi. This is in line with other studies that have shown a variance in the awareness about this indicator among women, where the awareness is as low as 16% to as high as 83% (Husain et al., 2019). A study from rural India had reported that only 16% of the married women were aware of HPV as a causative agent for cervical cancer (Arunadevi and Prasad, 2015). Another study from Tamil Nadu had reported awareness of 19% for HPV (Husain et al., 2019).

Regarding the risk factors and symptoms, about 48% and 45% of the study participants from Delhi and

Rohtak were able to identify one or more correct risk factors and symptoms for cervical cancer. It is to be noted that there were region-wide differences observed in the present study regarding the correct knowledge about risk factors and symptoms where women from Delhi (64.9% and 54.2%) were found to have better knowledge than women from Rohtak (30% and 37.7%) for both risk factors and symptoms, respectively. The figures from Delhi are in accordance with other studies (Mengesha et al., 2020; Owoeye and Ibrahim, 2013), while those from Rohtak reveal a poorer picture where the awareness is considerably lower than the studies from other lower-middle income countries (Kifle et al., 2020; Simo et al., 2021) (Mengesha et al., 2020) (Hoque and Hoque, 2009). The figures from Delhi are similar to a study from Ghana (Ebu et al., 2015) where 30.6% of the participants had heard about cervical cancer. Further, most of the women in the present study knew about risk factors such as early marriage, early childbirth, miscarriage/abortion, high parity, having multiple sexual partners, smoking/tobacco use, and alcohol consumption. At the same time, HPV and HIV infection, history of sexually transmitted diseases, genetic factors and not using a condom were identified as risk factors by nearly more than half of the women from Delhi. Most of the women from Rohtak were not aware of these risk factors. The majority of the women from Rohtak did not know about HPV and HIV infections as risk factors for cervical cancer.

When the predictors were considered, women with age at marriage below 18 years had better knowledge about both risk factors and symptoms of cervical cancer. A study from South India had found that women who were married below 18 years were more likely to get

Table 2. Percentage Distribution and Unadjusted Binary Logistic Regression Estimates for Knowledge about Symptoms of Cervical Cancer by their Background Characteristics, (n=1020)

Background characteristics	Total %	cOR (95% CI)	Delhi %	cOR (95% CI)	Rohtak %	cOR (95% CI)
Age (in years)						
30 years and less	41.7	Ref.	47.9	Ref.	35.8	Ref.
More than 30 years	48.4	1.31* (1.02,1.68)	54.9	1.32 (0.94,1.87)	39.3	1.16 (0.8,1.69)
Age at marriage (in years)						
Less than 18	52.1	Ref.	59.3	Ref.	34.2	Ref.
18 and above	43.2	0.70* (0.53,0.93)	48.5	0.65* (0.45,0.92)	38.3	1.19 (0.71,2)
Educational status						
Not educated	41.2	Ref.	55.6	Ref.	33.7	Ref.
Primary	53	1.61* (1.01,2.55)	58.6	1.13 (0.56,2.3)	44.8	1.59 (0.83,3.07)
Secondary	43.3	1.09 (0.69,1.72)	51.2	0.84 (0.41,1.73)	35.3	1.07 (0.57,2.01)
Higher	44.9	1.16 (0.79,1.71)	50	0.8 (0.43,1.5)	37.9	1.2 (0.71,2.02)
Marital status						
Never married	28.4	Ref.	41.4	Ref.	18.4	Ref.
Married	46.6	2.21* (1.28,3.81)	52.9	1.59 (0.74,3.39)	39.2	2.86* (1.23,6.64)
Widowed/Divorced/Separated	47.9	2.32* (1.07,5.05)	51.7	1.52 (0.54,4.28)	42.1	3.22 (0.95,10.97)
Employment Status						
Not employed	45.3	Ref.	51.7	Ref.	38.2	Ref.
Employed	46.4	1.04 (0.73,1.49)	54.7	1.12 (0.71,1.79)	33.3	0.81(0.44,1.47)
Income (in Rupees)						
5000 and less	39.1	Ref.	51.2	Ref.	36.3	Ref.
5000-8000	45.8	1.32 (0.91,1.9)	52.2	1.04 (0.5,2.16)	41.9	1.27 (0.81,1.98)
8000-10000	47	1.38 (0.95,2)	51.2	1 (0.51,1.96)	37.1	1.04 (0.59,1.84)
10000-15000	56.7	2.04* (1.35,3.07)	60	1.43 (0.72,2.85)	37.5	1.05 (0.44,2.54)
More than 15000	40.1	1.04 (0.69,1.58)	44.1	0.75 (0.37,1.53)	30.4	0.77 (0.38,1.54)
Cities						
Delhi	52.2	Ref.				
Rohtak	37.7	0.55* (0.43,0.71)				

%, percentage; Ref, Reference; *if p<0.05; cOR, Crude odds ratio; CI, Confidence interval

screened for cervical cancer, but the age of marriage had no influence on knowledge about cervical cancer. Further, in the present study, education was found to be an important predictor of knowledge about cervical cancer, consistent with other studies (Mitiku and Tefera, 2016). Employment and economic statuses have been found to be important determinants for knowledge about cervical cancer by various researchers (Al-Darwish et al., 2014; Mitiku and Tefera, 2016). However, these were not found to be significant predictors of poor knowledge in the present study.

The study had a few limitations also which cannot be ruled out. Firstly, the data was cross-sectional in nature, and hence, causality cannot be established. Secondly, the research was conducted in two districts, namely Rohtak and Delhi. As a result, extrapolating the study's findings to other settings may be limited. Finally, because the responses about knowledge of signs and symptoms of cervical cancer were self-reported, the study may have had a social desirability problem. However, a large sample size is one of the strengths of the study.

Conclusively, overall awareness about cervical cancer

and HPV as the causative agent was low, more so in Rohtak. This is extremely worrisome as blocking HPV infection is one of the most effective ways to prevent cervical cancer. Moreover, the knowledge about the risk factors and symptoms of cervical cancer is also inadequate, particularly in women from Rohtak. Cervical cancer is the commonest cancer among women in India, and the country shares the largest burden of cervical cancer patients in the world. Further, more than three-fourths of these patients are diagnosed late, resulting in poor prospects of long-term survival and cure. Women who are not aware and educated about cervical cancer are less likely to be screened and more likely to acquire the infection and subsequently the disease. Therefore, it is important that community-based education programs and interventions that focus on educating about HPV infection, its causes, modes of transmission and prevention, and identification of signs and symptoms for cervical cancer should be undertaken.

Table 3. Logistic Regression Estimates for Knowledge about Risk Factors and Symptoms of Cervical Cancer by their Background Characteristics, (n=1020)

Background characteristics	Risk factors			Symptoms		
	Total	Delhi	Rohtak	Total	Delhi	Rohtak
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
Age (in years)						
30 years and less	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
More than 30 years	0.82 (0.61,1.09)	0.89 (0.60,1.32)	0.73 (0.48,1.12)	1.15 (0.88,1.51)	1.30 (0.90,1.90)	1.01 (0.68,1.52)
Age at marriage (in years)						
Less than 18	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
18 and above	0.80 (0.54,1.16)	0.97 (0.61,1.53)	0.60 (0.29,1.24)	0.57* (0.40,0.82)	0.58* (0.37,0.90)	0.59 (0.3,1.18)
Educational status						
Not educated	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Primary	1.86* (1.12,3.10)	1.06 (0.49,2.29)	3.15* (1.52,6.5)	1.42 (0.88,2.30)	1.24 (0.60,2.59)	1.63 (0.84,3.16)
Secondary	1.54 (0.92,2.56)	1.44 (0.64,3.23)	1.48 (0.71,3.1)	1.08 (0.67,1.75)	1.00 (0.47,2.13)	1.15 (0.60,2.21)
Higher	1.42 (0.9,2.26)	0.87 (0.42,1.82)	2.08* (1.09,4)	1.36 (0.88,2.10)	1.17 (0.58,2.37)	1.53 (0.86,2.72)
Marital status						
Never married	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Married	4.26* (1.96,9.24)	3.55* (1.25,10.06)	6.21* (1.73,22.35)	3.02* (1.46,6.24)	2.00 (0.74,5.41)	4.77* (1.48,15.4)
Widowed/ Divorced/ Separated	5.68* (2.12,15.24)	5.03* (1.38,18.38)	6.99* (1.35,36.16)	3.08* (1.23,7.74)	1.95 (0.58,6.54)	5.64* (1.25,25.45)
Employment Status						
Not employed	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Employed	1.07 (0.72,1.58)	1.06 (0.63,1.77)	1.12 (0.59,2.13)	1.02 (0.70,1.49)	1.19 (0.73,1.96)	0.76 (0.41,1.43)
Income (in Rupees)						
5000 and less	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
5000-8000	1.01 (0.67,1.52)	0.96 (0.45,2.05)	1.04 (0.63,1.73)	1.16 (0.79,1.70)	1.01 (0.47,2.13)	1.28 (0.80,2.05)
8000-10000	1.32 (0.86,2.04)	1.47 (0.72,3.01)	1.05 (0.55,2.00)	0.93 (0.61,1.41)	0.87 (0.44,1.75)	0.94 (0.51,1.74)
10000-15000	1.43 (0.87,2.33)	1.56 (0.76,3.22)	1.24 (0.48,3.22)	1.33 (0.83,2.13)	1.28 (0.63,2.59)	1.03 (0.41,2.59)
More than 15000	1.24 (0.76,2.01)	1.25 (0.60,2.62)	1.28 (0.61,2.67)	0.74 (0.47,1.19)	0.70 (0.34,1.45)	0.74 (0.35,1.54)
Cities						
Delhi	Ref.			Ref.		
Rohtak	0.28* (0.21,0.39)			0.65* (0.48,0.88)		

%, percentage; Ref, Reference; *if p<0.05; aOR, Adjusted odds ratio; CI, Confidence interval; The model was adjusted for age, age at marriage; educational status; marital status; employment status; income and cities where survey was conducted.

Author Contribution Statement

SM, SKR and PRG conceived the study. AR and RG collected and cleaned the data, and obtained ethics approval and consent. SS and PRG analyzed the data. PRG, SS, SS and KK wrote the first draft of the paper. SM, and SKR reviewed and revised the manuscript. All authors approved the final version of the manuscript.

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Ethics Approval

This study was approved by the Institutional Ethics Committees of MAMTA Health Institute for Mother and Child, New Delhi, India.

Availability of Data and Materials

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

Conflict of interest

All authors have no conflicts of interest.

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