



ORIGINAL ARTICLE

**Assessment of Awareness of Cervical Cancer Among Adult Women Attending OPD in a Tertiary Care Hospital in Krishnagiri, Tamil Nadu: A Cross-Sectional Study**

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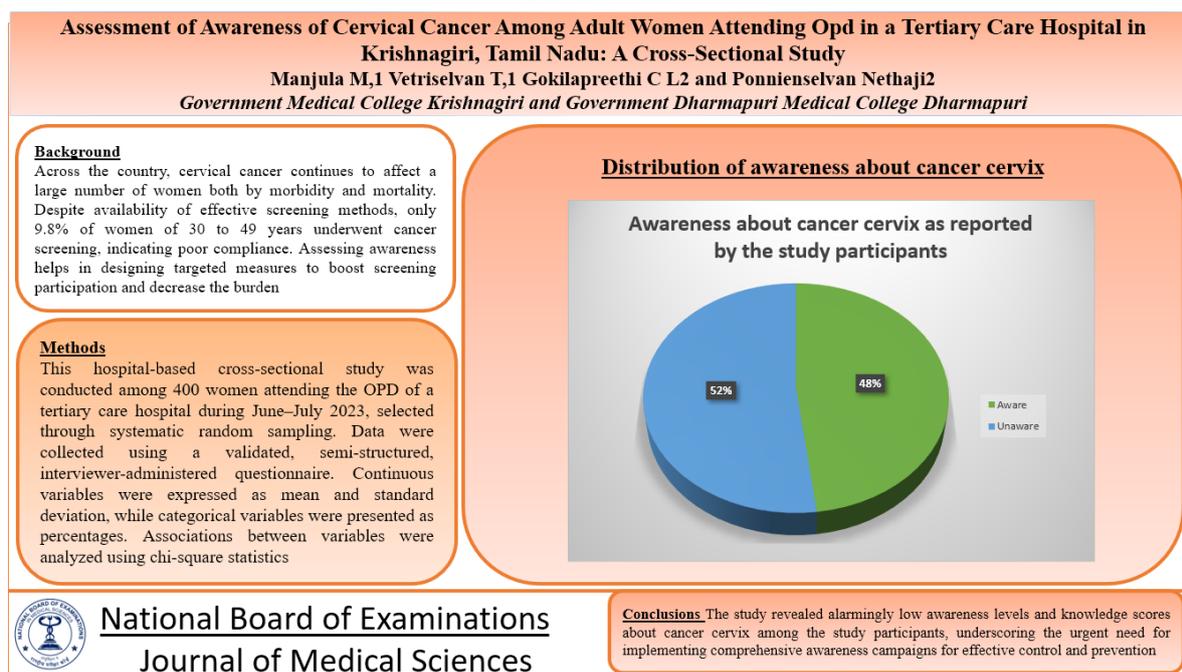
**Abstract**

**Background:** Across the country, cervical cancer continues to affect a large number of women both by morbidity and mortality. Despite availability of effective screening methods, only 9.8% of women of 30 to 49 years underwent cancer screening, indicating poor compliance. Assessing awareness helps in designing targeted measures to boost screening participation and decrease the burden. **Objectives:** Among adult women attending a tertiary care hospital OPD, Assessing awareness and its determinants about cervical cancer and its screening is our objective. **Methodology:** This hospital-based cross-sectional study was conducted among 400 women attending the OPD of a tertiary care hospital during June–July 2023, selected through systematic random sampling. Data were collected using a validated, semi-structured, interviewer-administered questionnaire. Continuous variables were expressed as mean and standard deviation, while categorical variables were presented as percentages. Associations between variables were analyzed using chi-square statistics. **Results:** 42.3±12.5 years was the Mean age of the study participants. 48% (192) reported that they are aware of cancer cervix. Awareness was significantly lower among illiterate, casual laborers and housewives. Of 129 who reported as aware about the screening facilities, only 57 (44.2%) had undergone screening. 12 (6.25%) were vaccinated against HPV. The mean knowledge score was dismally poor. Only 3 scored in the moderate range while none had good knowledge. **Conclusion:** The study revealed alarmingly low awareness levels and knowledge scores about cancer cervix among the study participants, underscoring the urgent need for implementing comprehensive awareness campaigns for effective control and prevention.

**Keywords:** Cancer cervix prevention, Knowledge and awareness, Screening, HPV

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## Graphical Abstract



### Introduction

According to the World Health Organization (WHO), cervical cancer accounts for 12% of all cancers in women and represents one of the most common gynaecological malignancy globally [1]. Globally, cervical cancer is the fourth most common cancer among women, with about 604,000 new cases and 342,000 deaths reported in 2020. Most of this burden falls on low- and middle-income countries, where limited access to screening, treatment, HPV vaccination, and broader socioeconomic factors contribute to the higher incidence and mortality. Timely screening and treatment of pre-cancerous lesions, coupled with Prophylactic HPV vaccination constitutes effective and cost-efficient measures for preventing cervical cancer. Notably, early diagnosis and prompt treatment offer a cure for cervical cancer. By adopting a thorough strategy encompassing prevention, screening, and treatment, it is possible to win over cancer

cervix as a public health concern within a single generation [2].

India is home to one-fifth of the global female population afflicted by this ailment [3]. Unfortunately, over three-fourths of these individuals receive diagnoses at advanced stages, significantly diminishing the likelihood of long-term survival and recovery [4]. Based on a Crude Incidence Rate of 23.5, it is currently estimated that 134,420 women are diagnosed with cancer cervix in India annually. Projections suggest that, the number of new cancer cervix cases could rise to 203,757 by 2025 [5].

The Tamil Nadu Cancer Registry (TNCR) ranks cancer cervix as the second most common cancer among women, constituting 16.1% of all female cancer cases. The age-adjusted incidence rate of cancer cervix in Tamil Nadu is documented at 14.1 per 1,00,000 women. TNCR findings reveal that the mortality rate attributed to cervical cancer in Tamil Nadu stands at 5.3 per 100,000 women [6].

## Background and Justification

Pap smear testing is one of the simple, yet effective screening method to detect cancer cervix at an early stage, reducing mortality by at least 80%. However, in India, Pap smear testing utilization is low, ranging from only 2.6% to 6.9% [7].

Despite the availability of free cancer screening through the initiative named "Makkalai Thedi Maruthuvam (MTM)" in Tamil Nadu, the recent National Family Health Survey (NFHS-5) reports only 9.8% of women of 30-49 years in the state have reported undergoing screening for cervical cancer [8], which highlights a significant gap in preventive healthcare utilization.

While early detection and vaccination can either prevent or combat the morbidity and mortality caused by this malignancy, the low utilization of screening facilities may be linked to the insufficient awareness regarding the risk factors, symptoms, and screening methods among women in India, highlighting the knowledge gap as stated in previous studies done in different territories [7].

Therefore, conducting an awareness study in our setting is important to identify those gaps in knowledge and attitudes towards cancer cervix screening and prevention, so as to develop targeted interventions to upscale awareness levels and increase screening uptake.

## Objectives

To assess the awareness and its determinants about cervical cancer and its screening methods among adult women attending OPD in a tertiary care centre.

## Review of Literature

A study among women in rural Chennai reported around 66.8% (197 out of 295) lacked awareness regarding cervical cancer. Of the remaining participants, 27.6% (27 out of 98) demonstrated a good level of knowledge, while 72.4% (71 out of 98) exhibited insufficient knowledge concerning cervical cancer [9].

A district-level analysis of screening for cancer breast and cancer cervix in India highlighted the common factors linked to participation in screening both cancers, including women from a general caste, residing in rural areas, being presently married, and having a relatively favorable economic status. Possessing insurance was specifically correlated with an increased likelihood of undergoing cancer screening. This research contributes to spatial insights by revealing the regional disparities in cancer screening rates across different districts in India [10].

A web-based cross-sectional survey among educated women in Tamil Nadu, revealed that over 50% of individuals, including those with higher educational backgrounds, lacked awareness regarding infection of HPV, cancer cervix, and vaccines for HPV [11].

A study among 100 professional female college students revealed that the majority of participants were not familiar with cancer cervix, PAP smear screening, and HPV vaccines [12].

Thus, multiple research works highlight a significant gap in awareness levels among the stakeholders regarding screening and prevention of cancer cervix. The potential tragedy of deaths from cancer cervix, a slow-developing and treatable condition preventable through screening, underscores the importance of addressing negative attitudes and knowledge gaps at an

early stage, well before women reach the ages appropriate for cancer screening and HPV vaccination [12].

### Subjects and Methods

This Cross-sectional study, a hospital-based work was done among adult women attending out-patient department in a tertiary care centre (GMCHK) with inclusion criteria as married (at least once) women attending OPD, giving consent for the study. Women who were not comfortable with the local language and those who were in the process of medical consultations or had other medical commitments were excluded from the study. Assuming 50% maximum variability, 5% alpha error, and 5% absolute precision, Sample size is estimated using the formula,  $N = Z_{\alpha}^2 \times pq / d^2$ . With Z value for  $\alpha$  at 0.05=1.96, Considering a 5% non-response rate, sample size was arrived as 400. The average number of female outpatients in a tertiary care hospital per day is 977. Considering the female OPD attendance per day as the sampling frame, by systematic random sampling method, every 50<sup>th</sup> woman was selected and If she doesn't fit as per inclusion criteria, consecutive women satisfying the criteria were included and proceeded further with 50 as the sampling interval. The study was

continued in the same pattern till the required sample size was achieved.

Data collection was done with a Interviewer administered, Semi-structured Questionnaire derived from a KAP questionnaire used in a hospital-based survey in south India [13], using Epicollect5 tool. The collected data were compiled in MS Excel and analyzed using SPSS version 16. Descriptive statistics were applied, with continuous variables presented as mean  $\pm$  standard deviation and categorical variables expressed as percentages. For inferential statistics, associations between categorical variables were assessed using the chi-square test.

### Results

#### Socio-demographic profile

The mean age of 400 study participants was 42.3 $\pm$ 12.5 years. The majority of them (70.8%) were in the age group of 30-60. About three-fourths had education levels up to high school. Over half (53.5%) were unemployed or housewives, while one-fifth were casual laborers. 57.5% belonged to urban areas and almost half (49.3%) were in the middle and lower middle socioeconomic classes as per Modified B.G. Prasad classification [14]. Socio-demographic details of the study participants are depicted in Table 1.

Table 1. Socio-demographic details of the study participants (n=400)

Socio-demographic variable	Category	Frequency (n)	Percentage (%)
Age	<30 years	88	22.0
	30-60 years	283	70.8
	>60 years	29	7.3
Educational status	Illiterate	117	29.3
	Primary school	61	15.3

	<b>Middle school</b>	81	20.3
	<b>High school</b>	74	18.5
	<b>Diploma</b>	28	7.0
	<b>Graduate</b>	38	9.5
	<b>Professional</b>	1	.3
<b>Occupation</b>	<b>Unemployed / Housewife / Retired</b>	214	53.5
	<b>Casual laborer/Daily wage worker</b>	83	20.8
	<b>Self-employed (Business/Agriculture)</b>	62	15.5
	<b>Salaried</b>	41	10.3
<b>Residence</b>	<b>Rural</b>	170	42.5
	<b>Urban</b>	230	57.5
<b>SES as per Modified B.G.Prasad classification</b>	<b>Class 1</b>	59	14.8
	<b>Class 2</b>	79	19.8
	<b>Class 3</b>	88	22.0
	<b>Class 4</b>	109	27.3
	<b>Class 5</b>	65	16.3

### Risk profile

The mean age at menarche, marriage, birth of 1st child, and menopause among the eligible participants was 13.7  $\pm$ 1.4 years, 19.1  $\pm$ 3.3 years, 20.8  $\pm$ 3.6 years, and 46.3  $\pm$ 4.8 years. 37.1% (148)

were multiparous, 6% (24) and 3.8% (15) of the study participants reported having long-term use of OCPs and family history of cervical cancer respectively (Table 2).

Table 2. Association between Socio-demographic variables and awareness about cancer cervix among the study participants (n=400)

Variable		Aware about cancer cervix (n=400)		p-Value
		Yes	No	
Age category	<30 Years	43	45	0.16
	30-60 years	140	143	
	>60 years	9	20	
	Illiterate	36	81	<b>0.0001*</b>
	Upto schooling	109	107	

<b>Education</b>	<b>&gt;schooling</b>	47	20	
<b>Occupation</b>	<b>Unemployed / Housewife / Retired</b>	77	137	<b>0.0001*</b>
	<b>Casual laborer /Daily wage worker</b>	33	50	
	<b>Self-employed (Business/Agriculture)</b>	48	14	
	<b>Salaried</b>	34	7	
<b>Residence</b>	<b>Rural</b>	87	83	0.27
	<b>Urban</b>	105	125	
<b>SES as per Modified BG prasad classification</b>	<b>Class I</b>	33	26	<b>0.004*</b>
	<b>Class II</b>	48	31	
	<b>Class III</b>	34	54	
	<b>Class IV</b>	55	54	
	<b>Class V</b>	22	43	
<b>Age at Menarche</b>	<b>&lt;13 years</b>	98	112	0.57
	<b>&gt;13 years</b>	94	96	
<b>Age at Marriage</b>	<b>&lt;18 years</b>	89	116	0.06
	<b>&gt;18 years</b>	103	92	
<b>Parity</b>	<b>Nulliparity</b>	6	7	0.002
	<b>≤ 2</b>	132	107	
	<b>&gt;2</b>	54	94	
<b>Age at Menopause (n=142)</b>	<b>&lt; 45 years</b>	24	41	0.62
	<b>45-50 years</b>	20	32	
	<b>&gt;50 years</b>	12	13	
<b>Long-term use of OCP</b>	<b>Yes</b>	12	12	0.84
	<b>No</b>	180	196	
<b>Family H/o Ca cervix</b>	<b>Yes</b>	14	1	<b>0.0001*</b>
	<b>No</b>	178	207	

\*p<0.05-statistical significance

### Awareness about cancer cervix

Overall 192 (48%) study participants reported that they are aware of cancer cervix. Among the women who reported as aware, undue vaginal bleeding (46.4%) and foul-smelling discharge (28.3%) were regarded as the symptoms they are aware of cancer cervix. Multiple sexual partners (31.2%) and prolonged use of OCP (19.1%) were perceived as risk

factors for cervical cancer among the study participants who were aware of cancer cervix. Most of them were aware of the availability of surgical treatment modality (40%) followed by chemotherapy (36.1%) and radiotherapy (23.9%) Figures 1, 2 and 3 depict the distribution of awareness of cancer cervix among the study participants, symptoms and risk factors that they were aware of, respectively.

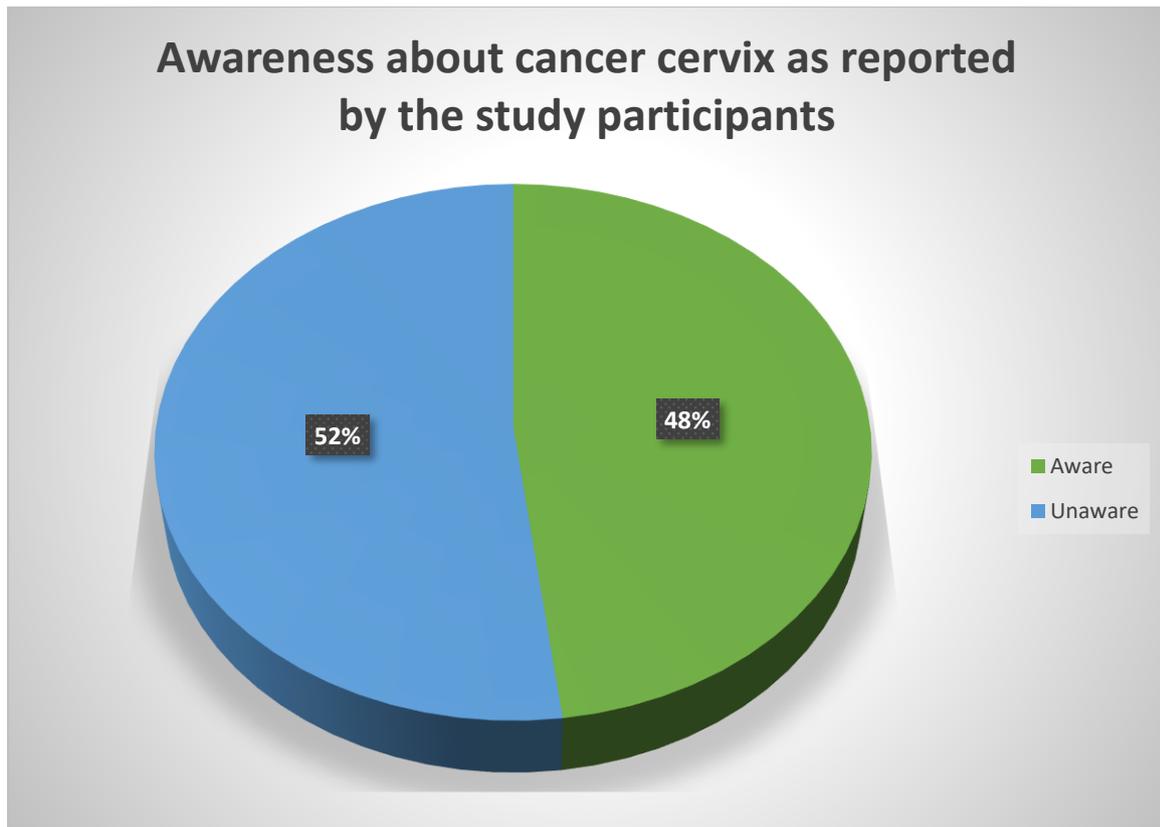


Figure 1. Distribution of awareness about cancer cervix (n=400)

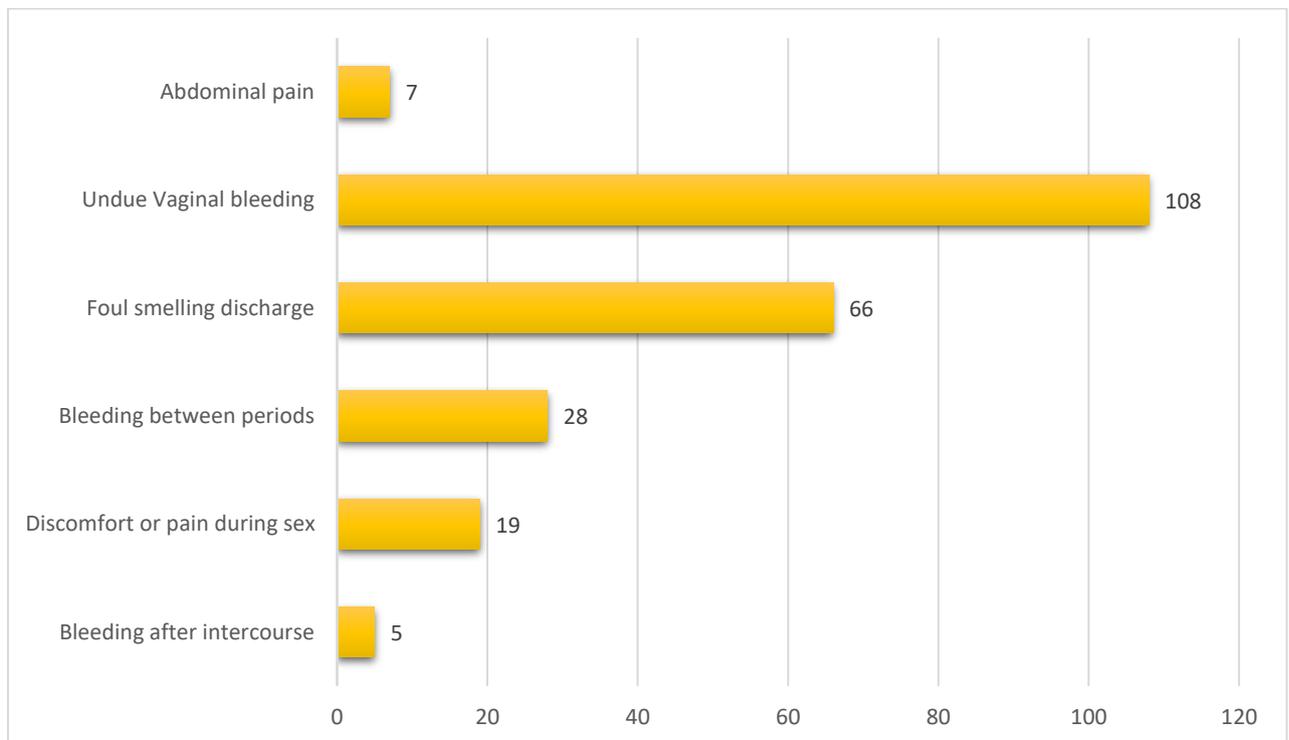


Figure 2. Symptoms recognized by study participants as being associated with cancer cervix

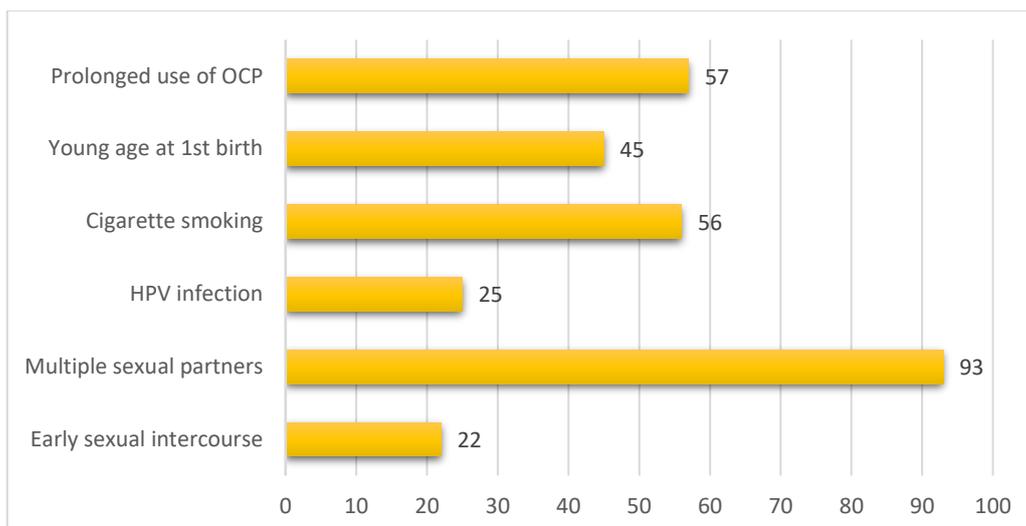


Figure 3. Risk factors identified by the study participants as being associated with cervical cancer

Awareness was significantly lower among illiterate women compared to those with schooling and above ( $p < 0.001$ ). It was also lower among casual laborers and unemployed housewives compared to self-employed and salaried women ( $p < 0.001$ ).

Among aware women, the most common source of information about cervical cancer were friends / relatives (38%), followed by health workers (34.6%). Two-thirds (67.2%) knew about

availability of screening tests for cervical cancer. This knowledge was significantly higher among younger women and unemployed housewives ( $p < 0.05$ ). The majority (80.6%) were aware that the screening test is available free of cost in government hospitals. Figure 4 shows the distribution of sources of information among those who reported as aware of the cervical cancer.

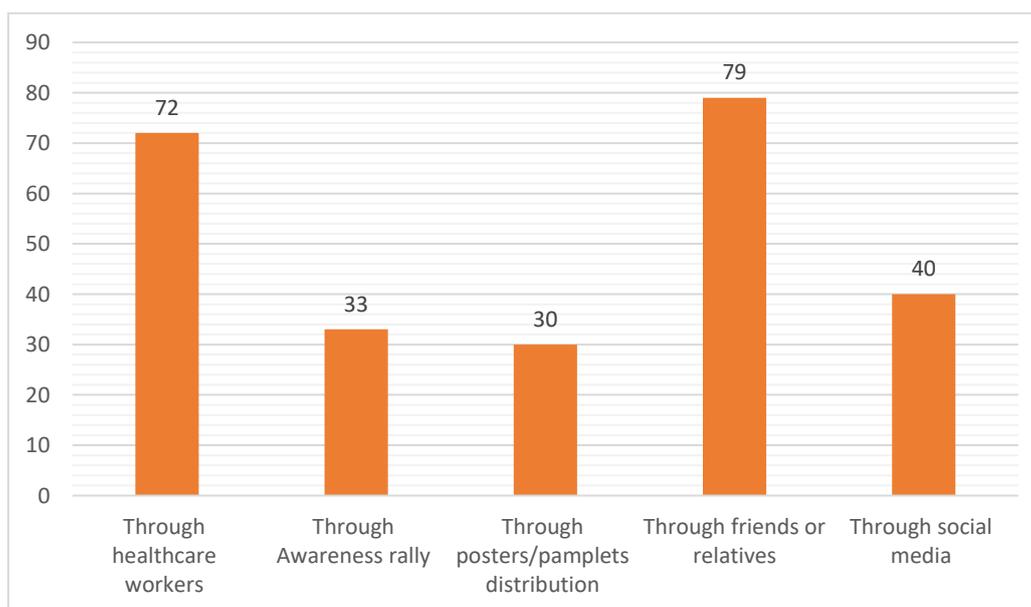


Figure 4. Sources of information reported by participants who were aware of cervical cancer

### Screening practices

Out of 129 women who reported as aware about the availability of screening facilities for cancer cervix, only 57 (44.2%) had undergone cervical cancer screening. Screening was significantly lower among women aged below 30 years (despite around 40% of them had education levels beyond schooling) and those with higher parity ( $p < 0.05$ ). It was higher among illiterate women and casual laborers compared to literate and working women, respectively. Over half had undergone screening in government hospitals (52.6%) while around one-third (35%) were in private facilities and the rest of them (12.3%) had it done in special camps.

### HPV Vaccination

Only 12 women (6.25%) were vaccinated against HPV. Vaccine uptake

was marginally higher in younger women and nulliparous women.

### Knowledge about cervical cancer

A composite score was used to assess the participants' overall knowledge about cervical cancer, with scores  $>16$  classified as good knowledge, scores between 12–15 as moderate knowledge, and scores  $<12$  as poor knowledge. The mean knowledge score was as low as 2.9 among all the study participants ( $n=400$ ). The mean score was not too high ( $5.9 \pm 2.6$ ) among those who have reported being aware of cancer cervix ( $n=192$ ). Only 3 women scored in the moderate range while none had good knowledge. Knowledge was marginally better among salaried women compared to unemployed and laborers. Figure 5 shows the knowledge scores of the study participants about the cervical cancer.

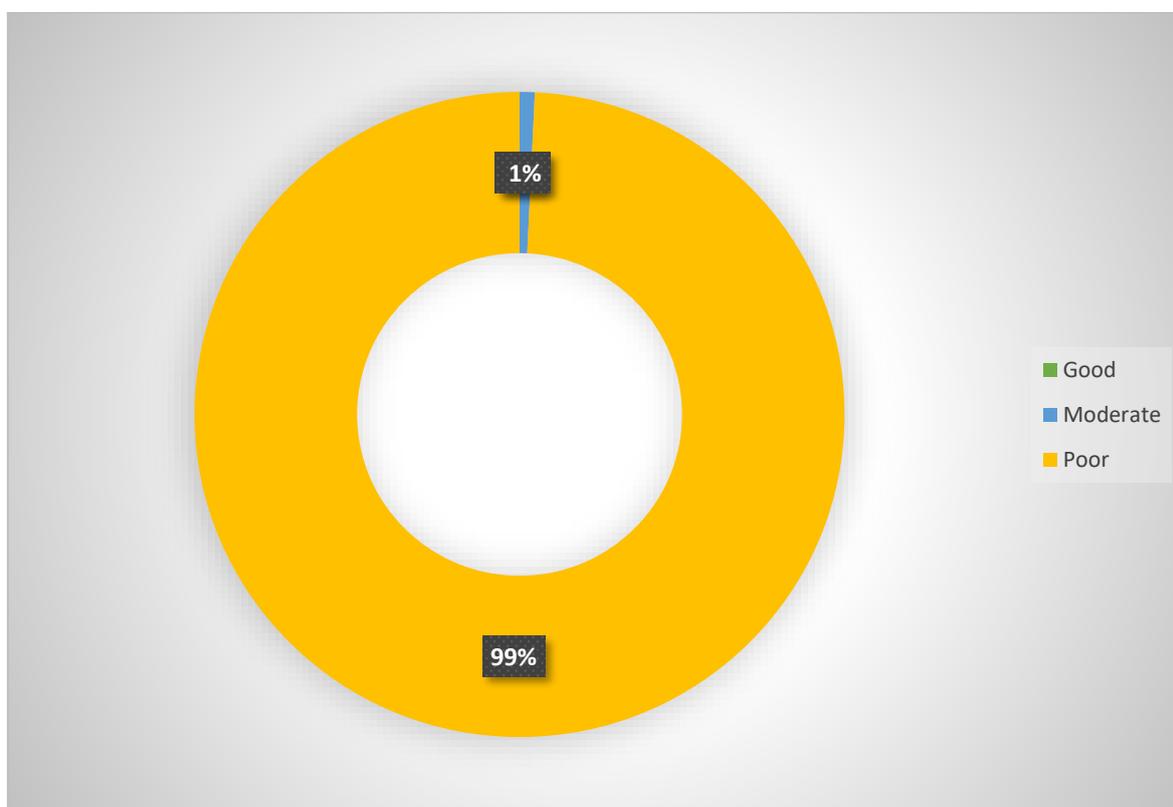


Figure 5: Overall knowledge levels of the study participants regarding cervical cancer

## Discussion

In our study, most participants were aged between 30–60 years (70.8%), with a mean age of  $42.3 \pm 12.5$  years. This is relatively higher compared to similar studies by Tamilarasi et al. [9] (a field-based study) and Narayana et al. [13], (hospital-based) where the mean ages were 32.9 and 34.8 years, respectively. The socio-demographic characteristics (education, occupation, and socioeconomic status) of our participants were comparable to those reported by Bansal et al. [15] in their study among women of reproductive age attending the OPD at AIIMS, Bhopal.

16.3% of the participants reported to have long-term use of OCP in a cross-sectional survey among women attending a tertiary care centre in Puducherry by Siddharthar et al. [16], which is as low as 6% in our study which might be attributed to the variance in the age group of the study participants.

48% of our participants were aware of cancer cervix, which is comparable with the results generated by similar hospital-based studies [16,17]. Regarding symptoms of cervical cancer among those who reported as aware, most regarded undue vaginal bleeding (41.2%) and foul-smelling discharge (28.3%) as symptoms of cancer cervix, which adds to the evidence generated by Narayana et al., where 48.3% and 27.8% regarded undue vaginal bleeding and foul smelling discharge respectively, as symptoms of cervical cancer [13]. The most common source for information was friends/relatives (38%) in our study whereas it was reported as media/ internet sources in a few other similar research works [13]. Education and occupation of the study participants were statistical determinants in awareness about cancer cervix in our study which echoes the

findings by Singh et al. [17], and Bansal et al. [15].

14.25% of study participants had undergone screening for cervical cancer which is comparable with the results of Bansal et al. [15], but quite lower when compared to the results of Siddharthar et al. [16], where around 30% of our study participants had undergone screening for cervical cancer, and better than the 5.4% as evidenced by Narayana et al. [13], and 6.9% as evidenced by Aswathy et al. [7]. It is also quite higher than the national average of 1.9% and state average of 9.8% [8]. Age, parity and literacy levels were the determinants for uptake of screening for cancer cervix in our study which is in support of the works by Aswathy et al. [7], Sankaranarayanan et al. [18], and Nene et al. [19]. The higher screening among illiterate, multi-para, and older women could possibly be provider-initiated owing to their higher risk status. The lower screening uptake among literate and working women as supported by findings of an online survey across multiple states in India by Agarwal et al. [20], highlights the need for targeted and tailored health education and motivation for promoting screening in this group.

6.25% (12) of the study participants reported to have received the HPV vaccine earlier, which is quite higher than expected in a setup with a rural backdrop and socio-demographical challenges, especially when HPV is not still a part of routine immunization programs. Lack of awareness about the vaccine availability and its role in cancer prevention appears to be the bottleneck to improved uptake of the HPV vaccine [21].

The overall levels of knowledge on cervical cancer, its symptoms, risk factors, screening modalities, and treatment options

available was sub-optimal among our study participants which is similar to the results generated by Thulaseedharan et al. [22], in their systematic review and way too less than the literature of similar kind [15], which signifies the need to work on the awareness generating campaigns to a larger scale. The findings of this study align with those of Adedemiji et al., who reported that micro-level factors—such as limited knowledge and awareness about cervical cancer and inadequate access to information—act as significant barriers for women in utilizing cervical cancer screening services [23].

Cervical cancer despite being the primary cancer affecting women, this research highlights the knowledge and awareness gap about its symptoms, risk factors, and screening facilities. This presses the need for widespread health education activities specifically targeting the stakeholders to enhance their awareness and underscore the significance of periodical screening as the guarding tool to prevent cancer cervix.

### **Conclusion**

The findings signify the demanding necessity for comprehensive strategic communication and awareness campaigns specifically targeted towards women. Cervical cancer, although preventable, continues to remain a significant threat to public health globally. Increasing awareness and knowledge about this condition, its symptoms, risk factors, prevention strategies, and the role of regular screening is paramount. By enhancing understanding and promoting early detection through regular screening, timely interventions can be implemented, potentially saving countless lives and limiting the overall burden of cancer cervix.

While knowledge is a crucial component, addressing the barriers that hamper access to cancer screening services is equally vital. Disparities in socioeconomic status, geographical limitations, and cultural beliefs can all contribute to the restricted access to these life-saving services. In addition to improving access, it is essential to address the cultural and social stigma surrounding cancer cervix and its associated risk factors. Cultural beliefs, misconceptions, and taboos often hinder open discussions and seeking preventive care. Engaging community leaders, religious figures, and influential personalities in awareness campaigns can help normalize conversations about cancer cervix and encourage women to prioritize their health. Furthermore, enhancing education and training for healthcare professionals can ensure that they are equipped to provide reliable information, dissipate myths, and offer compassionate and culturally sensitive care to women seeking screening and treatment for cancer cervix.

### **Limitation**

As a cross-sectional study conducted among women from rural areas attending a tertiary care centre, the findings may not be representative of a specific population or generalizable to the community with multiple socio-demographic differences. The use of interviewer-administered questionnaires could have influenced the results, as some women may have provided socially desirable responses, particularly for close-ended questions.

As this was a quantitative study, it could not explore in depth the psychosocio-cultural reasons for not undergoing screening. Conducting qualitative research

could provide deeper insights into the factors influencing those who have not opted for screening and help understand the perspectives of non-responders.

### Author Contributions

MM: Contributed to the conceptualization and definition of the intellectual content of the manuscript; VT was responsible for the design of the study, data analysis, and statistical analysis, and contributed to the definition of intellectual content; GCL and PN played a key role in literature search, data acquisition, manuscript editing, and manuscript review. PN will serve as the corresponding author / guarantor of the manuscript

### Conflicts of interest

The authors declare that they do not have conflict of interest.

### Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to restrictions (their containing information that could compromise the privacy of research participants).

### Ethical committee approval

This study has been approved by the Institution Ethics Committee - Government Medical College Krishnagiri carrying EC Reg No (COSCO): EC/NEW/INST/2023/15250, with Approval number 22012024, dated 11.05.2023

### Informed Consent

Informed consent has been obtained from the study participants after explaining the information on the study protocol,

potential risks and benefits, which included consent to participate and publish the data ensuring confidentiality, anonymity and data privacy

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