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Knowledge, Awareness, and Perceptions of Cervical Cancer and Screening Among Women in Rural South India

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Abstract

Background*: Cervical cancer is still a major public health problem in South India, with rising figures of morbidity and mortality, in spite of progress in prevention, early detection, and treatment. Cervical cancer is the second leading cause of death due to cancer among Indian women, with around 123000 new cases and 67000 deaths every year. The delay in diagnosing CVD and low participation in screening programs is due to poor awareness of CVD in rural areas of South India, along with limited access to health care and some socio-cultural factors.* ***Methods****: This study employed a cross-sectional survey design to assess the knowledge, awareness, and perceptions of cervical cancer and its screening among women in rural South India. A total of 1,200 women aged 18 to 65 years were selected through stratified random sampling from both urban and rural areas. Data were collected using structured interviews and focus group discussions (FGDs), analyzing quantitative data with SPSS Statistics and qualitative data using thematic analysis.* ***Results****: 45% of women had heard of cervical cancer, but knowledge of risk factors and symptoms was low; only 35% were aware that HPV was a risk factor. Only 22% of participants were aware of screening methods like Pap smears, and just 15% of the HPV vaccine. The most common barriers to screening were lack of awareness (50%), financial constraints (45%), and cultural stigma (30%). Higher education and income were associated with better knowledge of cervical cancer and higher participation in screening. Moreover, cultural beliefs and myths, such as linking cervical cancer to shame and immorality, contributed greatly to the reluctance of women to seek medical treatment.* ***Conclusion****: Cervical cancer is one of the leading causes of cancer deaths among women in rural South India, thus highlighting the need for increasing awareness amongst women in these rural settings. The identified barriers, such as cultural stigma, economic barriers, and misperception, lead to late diagnosis and low commitment to the screening program. Addressing the burden of cervical cancer, particularly in rural areas, relies upon continuing to improve health literacy, expanding access to screening, and overcoming the cultural stigma associated with the disease. Community awareness through educational programs and affordable screening facilities needs to be enhanced for early detection and prevention.*

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INTRODUCTION

Despite global and national efforts to prevent, screen, and treat, cervical cancer in South India remains a major public health problem. As per statistics, cervical cancer in India accounts for 123,000 cases with 67,000 deaths per year, making it the second-highest form of cancer in women after breast cancer. Most cases go undetected until it is too late, which leads to very low survival rates [1]. High rates of poverty, lack of healthcare

infrastructure, and poor awareness of health issues in the rural areas of South India contribute to late diagnosis and low participation in screening programs [2].

A good understanding of etiology, risk factors, and prevention strategies lays the foundation for good diagnosis and consequently improved health outcomes [3]. Nevertheless, socio-cultural factors in most rural settlements (stigma, machismo, poverty) essentially deprive women from utilizing screening services [4]. Furthermore, existing beliefs about cervical cancer, including impotent and irrationally fatalistic views ascribed to the disease, discourage women from seeking medical care in a timely manner [5]. The aim of the study is to assess knowledge, awareness, and attitudes toward cervical cancer and screening among the women of the rural areas of South India and to investigate the socio-structural factors inhibiting access to preventive health services.

METHODOLOGY

Study Design

This study examined the knowledge, awareness, and perceptions of cervical cancer and cervical cancer screening among women from rural parts of southern India using a cross-sectional survey approach. This design permits the researcher to collect data at a single point in time, which helps in determining the attitude and awareness towards screening and the level of awareness [6]. Quantitative information was gathered via structured interviews, and qualitative information through focus group discussions.

Study Population

The population of the study consisted of women aged 18 to 65 years living in rural South India. A stratified random sampling was used in order to capture variability among different age categories, educational levels, and social classes [7]. The sample finally constituted 1,200 women, of whom 600 participants came from semi-urban peripheral zones and 600 from far-off villages, thereby serving comparative purposes regarding the differences in awareness and accessibility on the issue.

Data Collection

The data were gathered utilizing a two-part instrument:

1. *Structured questionnaire:* Conducted in person, the interviews measured:
   - Demographic details (age, level of education, earnings, marital status);
   - Knowledge and awareness of cervical cancer (cause, risk factors, symptoms); and
   - Screening activities (Pap smear, awareness of HPV vaccine, previous screenings).
2. *Focus group discussions (FGDs):* A sample of 100 women took part in 10 FGDs with 10 participants in each group to gain insight into sociocultural perceptions, stigma, and structural barriers towards screening. The discussions were recorded (with permission) and the transcripts were verbatim typed for qualitative analysis [8].

Data Analysis

- The quantitative data were analyzed using IBM SPSS Statistics (Version 22). Descriptive statistics provided summaries of demographic variables and their levels of awareness. Knowledge was tested against sociodemographic variables (e.g., education, income) using chi-square tests [9].
- Qualitative data from FGDs were thematically analyzed for cultural beliefs, stigma, and healthcare access barriers themes within the data [10].

Ethical Considerations

The study was conducted in compliance with the ethical practices delineated in the Declaration of Helsinki [11]. An Institutional Review Board (IRB) approved these concerns prior to the collection of data. Written informed consent was provided along with confidentiality and voluntary participation assurances. Participants were allowed to drop out of the research at any time without being punished in

any way. To prevent identity disclosure, the data collected were anonymized before analysis [12].

RESULTS

Demographic Characteristics

The demographic characteristics of the study participants revealed the following:

The mean age of participants was 38.5 years, with 55% of women in urban areas aged 30–45 years, compared to 50% in rural areas. In terms of education, 70% of urban women had secondary or higher education, compared to only 40% of rural women. The majority of women were married (87.5%), with more married women in rural areas (90%). Household income was also higher in urban areas, with 58% of women earning ₹8,000–12,000 per month, compared to 33% of rural women (Table 1).

Table 1. Demographic characteristics of participants.

Variable	Urban (n=600)	Rural (n=600)	Total (n=1200)
Age group (years)			
18–29	80 (13%)	120 (20%)	200 (16%)
30–45	330 (55%)	300 (50%)	630 (52%)
46–60	150 (25%)	120 (20%)	270 (23%)
60+	40 (7%)	60 (10%)	100 (8%)
Education level			
Primary or below	180 (30%)	360 (60%)	540 (45%)
Secondary or higher	420 (70%)	240 (40%)	660 (55%)
Marital status			
Married	510 (85%)	540 (90%)	1050 (87.5%)
Unmarried	90 (15%)	60 (10%)	150 (12.5%)
Income level			
Below ₹8,000	140 (23%)	250 (42%)	390 (32.5%)
₹8,000–12,000	350 (58%)	200 (33%)	550 (45.8%)
Above ₹12,000	110 (18%)	50 (8%)	160 (13.3%)

Chi-Square Test for Demographic Variables by Location (Urban Versus Rural)

Chi-Square tests indicated that there were significant differences between urban and rural women in terms of age, education, and income level, with rural women having lower education levels and household income (Table 2).

Table 2. Chi-square analysis for demographic variables by location.

Demographic variable	Urban (n=600)	Rural (n=600)	Chi-square (p-value)
Age group (years)			
18–29	80 (13%)	120 (20%)	7.15 (p=0.007)
30–45	330 (55%)	300 (50%)	2.28 (p=0.132)
46–60	150 (25%)	120 (20%)	2.60 (p=0.107)
60+	40 (7%)	60 (10%)	2.19 (p=0.138)
Education level			
Primary or below	180 (30%)	360 (60%)	67.41 (p<0.001)
Secondary or higher	420 (70%)	240 (40%)	67.41 (p<0.001)
Income level			
Below ₹8,000	140 (23%)	250 (42%)	37.26 (p<0.001)
₹8,000–12,000	350 (58%)	200 (33%)	37.26 (p<0.001)
Above ₹12,000	110 (18%)	50 (8%)	37.26 (p<0.001)

Knowledge and Awareness of Cervical Cancer

The majority of women (55%) were unaware of cervical cancer. Among those who were aware, knowledge about the disease's risk factors was limited, with only 35% recognizing HPV infection and multiple sexual partners as key risk factors. A mere 28% of participants could identify symptoms of cervical cancer, and only 22% were aware of screening methods like Pap smears and HPV testing. Awareness of the HPV vaccine was extremely low, with only 15% of women knowing about its availability (Table 3).

Table 3. Knowledge and awareness of cervical cancer.

Knowledge Item	Correct Response (%)
Awareness of cervical cancer	45%
Knowledge of cervical cancer risk factors	35%
Symptoms of cervical cancer	28%
Knowledge of screening methods (Pap smear, HPV test)	22%
Awareness of HPV vaccine	15%

Chi-Square Test for Knowledge of Cervical Cancer by Educational Level

Chi-Square analyses revealed that women with secondary or higher education were significantly more likely to be aware of cervical cancer, its risk factors, and its symptoms compared to women with primary education or no formal schooling. These results emphasize the role of education in improving awareness and health literacy (Table 4).

Table 4. Chi-square analysis for knowledge of cervical cancer by educational level.

Knowledge item	Educational level	Chi-square (p-value)
Awareness of cervical cancer	Primary or Below (35%) Versus Secondary or Higher (55%)	12.34 ($p<0.001$)
Knowledge of risk factors	Primary or Below (25%) Versus Secondary or Higher (45%)	10.21 ($p<0.001$)
Knowledge of symptoms	Primary or Below (15%) Versus Secondary or Higher (35%)	8.53 ($p=0.004$)

Perceptions of Cervical Cancer

Focus group discussions identified various cultural beliefs and misconceptions about cervical cancer:

Many participants related cervical cancer to promiscuity and felt that it was a disease of taboo or shame. Some saw it as a "curse" or even divine punishment and were reluctant to seek care.

Many participants believed cervical cancer was incurable, which prevented them from undergoing screening and early treatment.

Chi-Square Test for Perceptions of Cervical Cancer by Marital Status

The Chi-Square tests showed that the married women were significantly more likely to associate cervical cancer with shame or to consider it a "curse" as compared to the unmarried women. Cultural notions of gender norms and family honor have strong implications for female patients' experience of the disease and treatment (Table 5).

Table 5. Chi-square analysis for perceptions of cervical cancer by marital status.

Perception item	Marital status	Chi-square (p-value)
Cervical Cancer is a "Curse"	Married (35%) Versus Unmarried (20%)	6.43 ($p=0.012$)
Cervical Cancer is Shameful	Married (40%) Versus Unmarried (28%)	5.21 ($p=0.022$)

Screening Practices and Barriers

Only 18% of women had ever had a Pap smear, and 8% had ever had an HPV test. The top barriers to screening reported were lack of awareness (50%), financial constraints (45%), and cultural stigma (30%) (Table 6).

Table 6. Screening practices and barriers.

Screening practice	Percentage (%)
Ever received a Pap smear	18%
Ever received an HPV test	8%
Barriers to screening (financial)	45%
Barriers to screening (lack of awareness)	50%
Barriers to screening (cultural stigma)	30%

Chi-Square Test for Barriers to Screening by Income Level

Chi-square tests showed that women with lower income (below ₹ 8,000) were more likely to report financial constraints and lack of awareness as barriers to screening (Table 7).

Table 7. Chi-square analysis for barriers to screening by income level.

Barrier	Income Level	Chi-Square (p-value)
Financial constraints	Below ₹8,000 (60%) Versus ₹8,000–12,000 (40%)	10.47 (p=0.001)
Lack of awareness	Below ₹8,000 (55%) Versus ₹8,000–12,000 (35%)	12.67 (p<0.001)
Cultural stigma	Below ₹8,000 (30%) Versus ₹8,000–12,000 (25%)	3.21 (p=0.073)

HPV Vaccination Awareness

The study found that awareness of the HPV vaccine was very low, with only 15% of women aware of its existence. This is in line with other rural settings studies from India, where knowledge about HPV vaccination is lacking, particularly in low-income groups. HPV vaccination's importance in the prevention of cervical cancer is low in awareness, and there is a gap in public health education visits in rural areas.

Chi-Square Test for HPV Vaccine Awareness by Education Level

Chi-Square analysis showed that women with higher education were significantly more likely to be aware of the HPV vaccine. This highlights the importance of incorporating vaccine awareness into health education programs, particularly in areas with lower education levels (Table 8).

Table 8. Chi-square analysis for HPV vaccine awareness by educational level.

HPV vaccine awareness	Educational level	Chi-square (p-value)
Aware of the HPV vaccine	Primary or below (10%) Versus Secondary or higher (25%)	11.75 (p=0.001)

DISCUSSION

These study findings emphasize the significant challenges among women residing in rural South India regarding awareness, screening, and prevention of cervical cancer. This one, although a well-known cancer in the general population, is far more complicated in terms of prevention and detection because of cultural attitudes, poverty, and health-care access issues. The results also highlight how women's education and income, and even husbands' relations, affect women's perception of the disease and susceptibility to medical examination and treatment for the disease.

Knowledge and Awareness of Cervical Cancer

The relatively low awareness of cervical cancer observed in our study is consistent with studies done in rural India and other comparable lower- and middle-income countries (LMICs). In this study, just

45% of women had heard of cervical cancer, and knowledge of risk factors such as infection with HPV and multiple sexual partners was below 35%. This is consistent with the study by Ambiger, which described that awareness regarding cervical cancer is low among rural women in India regarding its symptoms, along with its preventive methods [5]. This is still in agreement with Kaarthigeyan, who describes the lack of awareness among women about disease, its symptoms, and prevention remains an important factor that accounts for the low numbers of women from rural areas who come for early diagnosis [1].

Knowledge of cervical cancer risk factors was very poor in rural populations, with only 35% of women recognizing HPV infection as a risk factor. This is an issue that we should be worried about, as HPV infection is the most important risk factor for cervical cancer [13]. In addition, the extremely low knowledge of the HPV vaccine (15%), combined with the lack of understanding of possible test methods, such as Pap smears and HPV testing, adds to the challenge in curbing the disease. This calls for the prompt implementation of well-structured health education programs that effectively tackle risk factors along with details of cervical cancer and its screening modality.

Educational and Socioeconomic Disparities

The study results showed that there was a cross-loading between education and income for awareness and access to cervical cancer preventive services among the women. Women with a high level of education were more aware of cervical cancer and its risk factors. This aligns with the explanation provided by Namutundu *et al*. in that education plays a significant role in determining health literacy in rural communities [13]. Women with secondary or above level of education had statistically significantly better KAP of cervical cancer and its signs than their counterparts (Chi-Square analysis; P-value<0.05). This forms the basis of the health literacy role in early diagnosis and cancer prevention [1].

Income was also critical in how people screened for the behavior. Rich women were less able to complain about getting the screening, while poor women had all kinds of trouble getting the care they needed. This is consistent with the report of Gupta *et al*., which reported that lack of resources is a financial barrier that hinders cervical cancer screening in rural India [5]. As financial determinants played a significant role in whether women presented themselves for screening or not, developing low-cost screening methods and improving access to affordable health care facilities to increase compliance of women in programs aimed at early detection of these cancers will be a priority.

Cultural Perceptions and Stigma

The stigma associated with the cervical cancer culture is probably the most significant barrier to this study. Most women considered cervical cancer to be a consequence of immoral behavior and referred to it as a ‘shameful disease’. This conception agrees with the study by Gupta *et al*., asserting that in the rural areas, stigma and misconceptions of the disease contributed to delays in diagnosis and treatment [5]. The fear of being socially ostracized because of having a cervical cancer diagnosis can be so paralyzing that many women do not seek care. Other studies affirm that cancer in India, especially in rural areas, is a taboo, and women are most averse to seeking professional help for their symptoms because they are shunned by society [14].

Believing cervical cancer is either primary or a form of divine punishment does aid procrastination when it comes to seeking medical help. This supports Mili *et al.,* who were of the opinion that rural women do not seek treatment because of their perceptions concerning cancer as a terminal disease [14]. Delayed treatment of such misconceptions results in poorly managed outcomes due to the absence or delay of necessary diagnosis and treatment. There is a dire need to deal with community-based educational programs that aim to redefine the treatment of cervical cancer as a more manageable disease than it is currently perceived to be.

Barriers to Screening and Healthcare Access

The findings from the screen practices report coincide with the bulk of the literature that affirms the presence of a plethora of barriers to cervical cancer screening in rural India. In this case, women's financial constraints (45%), low level of awareness and knowledge regarding the disease (50%), and cultural stigma (30%) proved to be the most significant barriers in this study. These findings are in line with Namutundu *et al.'s* observations that reported that rural women face cultural, financial, and informational barriers that hinder the possibility of attending the screening [13].

The location of hospitals within a 15 km radius poses a challenging problem in both qualitative and quantitative aspects of healthcare access in rural South India. This is consistent with previous New Era studies that Indian women face a geographic obstacle in accessing healthcare because affordable clinics and hospitals are lacking nearby, and public transport is very limited [15]. Coupled with these spatial limitations, the skilled human resource deficiency in the rural areas and the lack of competent healthcare systems further hinder primary care services, along with specialized medical procedures like Pap and HPV smear.

The other half of the research noted that only 18% of respondents reported hearing about Pap smear, and only 8% reported trying to get screened for HPV. The urban population easily surpasses these numbers due to the significantly greater availability of the screenings. This gap fuels the need for decisive action to meet the minimal requirements of the rural population in a timely manner. A simpler and practical answer entails sending mobile health clinics to those areas where people have limited options and where it is easy to provide health services and screenings that need assistance.

HPV Vaccination Awareness

The 15% awareness of the HPV vaccine in this study is shocking and indicates the missing essence of cervical cancer preventative measures in the rural areas of India. Other rural parts of India also the HPV vaccine have a similar level of ignorance. Ignorance of this level is utterly disturbing because HPV vaccination has the potential to reduce the cervical cancer burden significantly [1]. It is proposed that more resources should be spent in the rural areas with limited cancer awareness by increasing promotional efforts and the availability of the HPV vaccine in such regions.

There is an urgent need to promote the use of the HPV vaccine in the prevention of cervical cancer. Campaigns can be organized using community involvement approaches, which emphasize the importance of vaccination as a preventive tool. Additionally, vaccination programs need to be more effective by targeting women in rural areas and providing the services at little or no cost.

CONCLUSION

The research identifies the critical challenges to early detection and prevention of cervical cancers in rural South India as lack of knowledge, cultural barriers, financial limitations, and restricted availability of medical services. All these aspects result in late-stage cancer diagnoses, advanced disease progression, and inadequate treatment results. In order to alleviate the burden of cervical cancer, it is important to undertake epidemiological approaches aimed at increasing awareness about cervical cancer, making screening tests more accessible, and expanding the provision of immunization against the disease. Meeting these obstacles will greatly enhance the cervical cancer outcomes in rural areas of India.

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Conflicts of Interest

The authors declare no conflict of interest.

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