



KNOWLEDGE, ATTITUDE AND PRACTICE OF CERVICAL CANCER AND ITS SCREENING AMONG VARIOUS EDUCATIONAL STREAMS OF VIGNAN'S UNIVERSITY, GUNTUR, INDIA

Daniel Finney Sankuru¹, Chinnababu Sunkavalli²,
Satya Sree Nannapaneni³, Vuppuluri Keerthana⁴,
Phanindra Dulipala⁵

^{1,4} Post graduate, Department of Community Medicine, Katuri Medical
College & Hospital, Guntur, India

² Clinical Director & Surgical Oncology Consultant, Yashoda Hi-tech City
Hospital, Hyderabad, India

³ Professor, Department of Chemistry, School of AS&H, Vignan's
University, Guntur, India

⁵ Professor & Head, Department of Community Medicine, Katuri Medical
College & Hospital, Guntur, India

Email: ¹ drdanielysc@gmail.com, ² chinna@gracecancerfoundation.org,
³ drnss_sh@vignan.ac.in, ⁴ vuppulurikeerthana@gmail.com,
⁵ drpdulipala@gmail.com

Abstract

Cervical cancer is the fourth most prevalent cancer amongst women worldwide and it is the second most common cancer among women in India. Screening is an important preventive measure against cervical cancer which can help in early detection of pre-/cancer lesions. There is very little data on the knowledge, attitude and practices of females about cervical cancer and its screening in South India. Therefore, this cross-sectional study was conducted among 2400 female students employing stratified random sampling for different educational streams at Vignan University, Guntur in India. Just over 50.54% had heard of cervical cancer and 48.12% had heard about the Pap smear. The mean knowledge score was significantly higher among females aged more than 21 years, those belonging to upper middle socio-economic classes and those pursuing post-graduation ($p < 0.05$). 36.41% of the study subjects had adequate knowledge and 75.87% had favourable attitude towards cervical cancer screening and almost 12.5% had a Pap smear test at least once.

Keywords: *Cervical Cancer, Educational Streams, Pap Smear, Screening*

1. Introduction

Cervical cancer occurs in the cervix of women, and nearly all cervical cancers (99%) are associated with high-risk human papillomavirus (HPV) infection [1]. Cervical cancer is the second most common health problem for women worldwide. About 80% of the cervical cancers occur in developing countries [2].

Long-term infection with high-risk HPV can lead to cancer in the parts of the body where HPV infects cells, such as the cervix, oropharynx, anus, penis, vagina, and vulva [3]. Most HPV infections heal on their own and cause no symptoms, but persistent infection can lead to

cervical cancer in women [1]. The highest reported incidences worldwide are in eastern, western and southern Africa. Projections predict that nearly half a million women will die from cervical cancer by 2030, with more than 98% of those deaths expected to occur in low- and middle-income countries [4]. Cervical cancer is the fourth most common cancer among women worldwide and the second most common cancer among women in India [5].

Sexually transmitted human papillomavirus (HPV) infection is the most important risk factor for cervical intraepithelial neoplasia and invasive cervical cancer [6]. The global incidence of cervical cancer is approximately 510,000 new cases per year and approximately 288,000 deaths worldwide [7]. Unlike many other cancers, cervical cancer occurs early and occurs during the productive period of a woman's life. Incidence increases at age 30-34 years, peaking at age 55-65 years, with a median age of 38 years (21-67 years). It is estimated that more than 80% of sexually active women over the age of 50 will be infected with genital HPV [8]. Therefore, the introduction of a vaccine against HPV has gained such popularity and relevance.

HPV vaccination is the primary level of prevention against cervical cancer. This vaccine is more than 99 percent effective in preventing cervical cancer in girls aged 9 to 14 when given before sexual contact. This vaccine protects against genital warts and other cancers such as anal, vulvar, vaginal, penile, oropharyngeal, and some head and neck cancers.

Screening is the secondary level of prevention against cervical cancer. Cervical cancer screening detects changes in cells in the cervix that cause cancer. Screening may include cervical cytology (also called Pap test or Pap smear), human papillomavirus (HPV) testing, or both. It usually takes 3 to 7 years for advanced changes in cervical cells to develop into cancer. Early detection of cervical cancer can catch these changes before they become cancer (5).

2. Aims & Objectives

To study the knowledge, attitude and practice of cervical cancer screening among the various educational streams of Vignan's University, Guntur, India.

1. To assess the knowledge, attitude and practice of cervical cancer and its screening.
2. To assess the association between the knowledge, attitude and practice with the various socio-economic classes and educational backgrounds of the study subjects.

3. Methodology

Study design: Cross-sectional study

Study setting: Vignan University, Guntur, Andhra Pradesh, India

Study population: Students pursuing various educational streams in Vignan's University, Guntur, India.

Study period: March 8, 2023

Sample size: Sample size was calculated using the formula, $n=4pq/d^2$
where $z=1.96$, p = prevalence, $q= 100$ -prevalence, $d= 5\%$ of prevalence

Estimated prevalence is taken as 40% based on a cross-sectional study in Qatar by F.M. Al-Meer et al [9].

5% Relative precision is taken, hence $d=5\%$ of prevalence (5% of $40=2$)

$n = 4 \times 40 \times 60 / 2 \times 2$
= 2400 study subjects.

Sampling technique: Stratified Simple Random Sampling

Study instrument: Self-designed, semi structured and pre-tested questionnaire

Inclusion Criteria: All the females who have given consent to participate in the survey.

Exclusion Criteria: Females who were already diagnosed with cervical cancer.

Study method: The female students in Vignan's University were classified into different strata based on their educational stream. Out of the five educational streams in the University, 480 female students were randomly selected from each stratum based on the inclusion and exclusion criteria, until the required sample size of 2400 was attained. The questionnaire was distributed to the participants from each educational stream and their responses were recorded.

Operational definition

- Knowledge-Participants who have scored greater than or equal to 4 correct answers from 7 knowledge questions were considered to have adequate knowledge, and those who had scored less than 4 correct answers were considered to have inadequate knowledge.
- Attitude-Participants who have scored greater than or equal to 4 correct responses from 7 attitude questions were considered to have a favorable attitude and those who had scored less than 4 were considered to have unfavorable attitude.
- Screening practice-Participants who are screened for cervical cancer at least once.

Ethical clearance: Ethical clearance was taken from Institutional Ethics Committee (IEC).

Data analysis: Data collected was entered into Excel sheet and the statistical analysis was done using the IBM Statistical Package for Social Sciences v20.

4. Results

Socio-demographic characteristics of participants:

Among a total of 2400 students, there were 480 female students from each of the following disciplines – biotechnology, engineering, management, pharmacy and post-graduate scholars. Just over 50.54% had heard regarding cervical cancer and 48.12% had heard about the Pap smear. Overall, 36.41% of the study subjects had adequate knowledge, 75.87% had favourable attitude towards cervical cancer screening, while only 12.5% underwent a Pap smear test at least once in their lifetime.

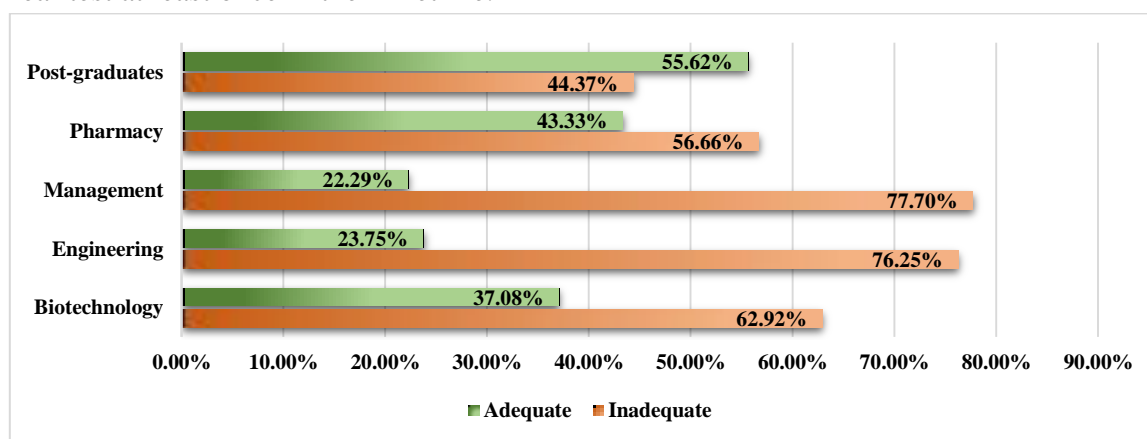


Fig.1- Overall knowledge of cervical cancer screening in various educational streams

According to Fig.1, 55.62% of post-graduates and 43.33% of pharmacy students had adequate knowledge. Conversely, a greater proportion of students from management (77.7%) and engineering (76.25%) had inadequate knowledge regarding the cervical cancer screening.

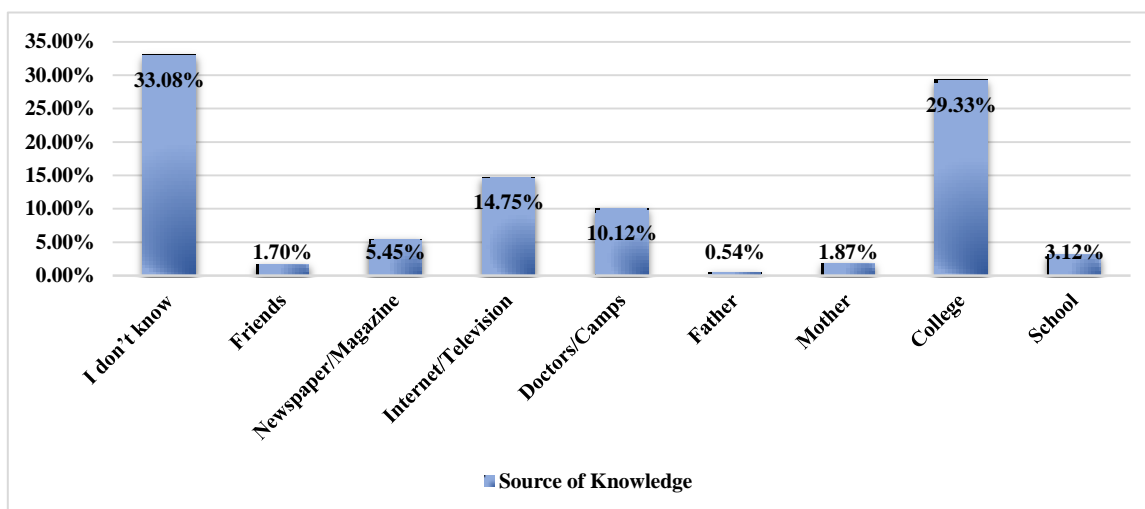


Fig.2- Source of knowledge regarding cervical cancer and its screening

From Fig.2, most of the students came to know about cervical cancer and its screening from their college education (29.33%), through internet/television (14.75%) and from doctors during camps (10.12%).

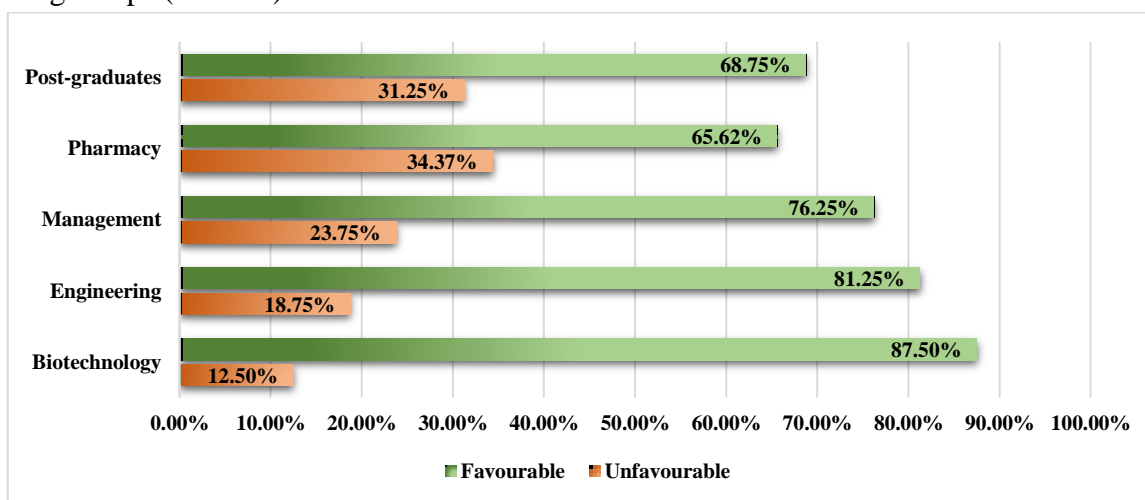


Fig.3- Overall attitude of cervical cancer screening in various educational streams

Regarding attitude towards cervical cancer screening, 87.5% of biotechnology students, 81.25% of engineering students and 76.25% of management students possessed favourable attitude as per Fig.3.

According to Table-1, one way ANOVA test was done for knowledge, attitude and practice among the various educational streams and the results portrayed that the knowledge mean score (3.40 ± 2.44) was highest among the post-graduate scholars but the attitude mean score was the least among the same (4.12 ± 1.53). Similarly, the knowledge mean score (3.29 ± 2.89) was higher among the pharmacy students but the attitude mean score was the lesser among the same (4.30 ± 1.93).

Table-1: One way ANOVA for knowledge, attitude, practice with educational streams

	EDUCATIONAL STREAMS	N	MEAN (SD)	P-VALUE
KNOWLEDGE	Biotechnology	480	2.68(2.48)	
	Engineering	480	2.02(2.20)	
	Humanities & Management	480	2.09(2.31)	
	Pharmacy	480	3.29(2.89)	
	Post-graduates & Scholars	480	3.40(2.44)	
	Total	2400	2.70(2.54)	<0.0001
	ATTITUDE	Biotechnology	480	5.12(1.51)
Engineering		480	4.70(1.48)	
Humanities & Management		480	4.69(1.72)	
Pharmacy		480	4.30(1.93)	
Post-graduates & Scholars		480	4.12(1.53)	
Total		2400	4.59(1.68)	<0.0001
PRACTICE		Biotechnology	480	0.14(0.35)
	Engineering	480	0.11(0.31)	
	Humanities & Management	480	0.13(0.33)	
	Pharmacy	480	0.09(0.29)	
	Post-graduates & Scholars	480	0.13(0.34)	
	Total	2400	0.12(0.33)	0.108

The attitude mean score (5.12±1.51) was highest among the biotechnology students, whose practice mean score was also the highest (0.14±0.35). These results portrayed a statistical significance between the knowledge (p<0.0001) and attitude (p<0.0001) within the different educational streams.

Table-2: One way ANOVA for knowledge, attitude, practice with socioeconomic class

	SOCIOECONO MIC CLASS	N	MEAN (SD)	P-VALUE
KNOWLEDGE	Upper	516	2.72(2.55)	
	Upper Middle	510	2.82(2.50)	
	Lower Middle	514	2.75(2.53)	
	Upper Lower	430	2.57(2.54)	
	Lower	430	2.59(2.59)	
	Total	2400	2.70(2.54)	0.50
ATTITUDE	Upper	516	4.57(1.66)	
	Upper Middle	510	4.70(1.64)	
	Lower Middle	514	4.54(1.71)	
	Upper Lower	430	4.64(1.66)	

PRACTICE	Lower	430	4.47(1.73)	
	Total	2400	4.59(1.68)	0.26
	Upper	516	0.11(0.31)	
	Upper Middle	510	0.11(0.32)	
	Lower Middle	514	0.12(0.32)	
	Upper Lower	430	0.13(0.34)	
	Lower	430	0.14(0.35)	
	Total	2400	0.12(0.33)	0.57

According to Table-2, one way ANOVA test was done for knowledge, attitude and practice among the students belonging to various socioeconomic classes; upper middle-class students (510) had highest mean score of knowledge (2.82 ± 2.50) and attitude (4.70 ± 1.64). Whereas, the students belonging to lower class had comparatively higher mean value of practice (0.14 ± 0.35). There was no statistical significance between the knowledge, attitude and practice within different socioeconomic classes.

Table-3: One way ANOVA for knowledge, attitude, practice with age

	AGE	N	MEAN (SD)	P-VALUE
KNOWLEDGE	Less than 21 years	1824	2.51(2.54)	
	21 years and more	576	3.29(2.54)	
	Total	2400	2.70(2.54)	<0.0001
ATTITUDE	Less than 21 years	1824	4.70(1.69)	
	21 years and more	576	4.22(1.61)	
	Total	2400	4.59(1.68)	<0.001
PRACTICE	Less than 21 years	1824	0.12(0.32)	
	21 years and more	576	0.13(0.34)	
	Total	2400	0.12(0.33)	0.107

Table-4: One way ANOVA for knowledge, attitude, practice with mother's education

	MOTHER'S EDUCATION	N	MEAN (SD)	P-VALUE
KNOWLEDGE	Related to Medical & Health	296	3.06(2.55)	
	Unrelated to Medical & Health	2104	2.65(2.53)	
	Total	2400	2.70(2.54)	<0.05
ATTITUDE	Related to Medical & Health	296	4.64(1.66)	
	Unrelated to Medical & Health	2104	4.58(1.68)	
	Total	2400	4.59(1.68)	<0.05
PRACTICE	Related to Medical & Health	296	0.21(0.41)	
	Unrelated to Medical & Health	2104	0.11(0.31)	
	Total	2400	0.12(0.33)	0.316

The knowledge score (3.29 ± 2.54) and practice score (0.13 ± 0.34) were higher among the students of the age group 21 years and more. Comparatively, students less than 21 years had

more favourable attitude (4.70 ± 1.69) towards cervical cancer screening. There was a statistical significance between the knowledge and attitude with the age group of the students, as per Table-3. The knowledge, attitude and practice were higher among the students whose mother's education was related to medical and health, 3.06 ± 2.55 , 4.64 ± 1.66 and 0.21 ± 0.41 respectively, according to Table-4.

5. Discussion

The results underscore a concerning lack of awareness about cervical cancer among the study participants. Merely 36.41% demonstrated adequate knowledge, indicating that a substantial portion of the population remains uninformed about the disease and its risk factors. This finding is consistent with the notion that an individual's awareness and understanding of health problems is an important factor in their behaviour when seeking medical care [9]. The observed low level of Pap smear uptake even among educated females highlights the urgency of improving awareness campaigns to address this gap. The current study lacks sufficient knowledge when compared with similar studies conducted in different regions. For example, a study conducted in Hawassa, Ethiopia, found that 56.8% of female students had sufficient knowledge [10]. A study in Nigeria also reported a higher knowledge rate of 63.0% [11]. This contradiction suggests that tailor-made awareness-raising efforts specific to the South Indian context are essential to achieve improved knowledge dissemination.

Despite the limited knowledge, the study found a surprisingly positive attitude towards cervical cancer screening among the students. A remarkable 75.87% exhibited a favourable attitude, which surpasses figures reported in studies conducted in Wollega University, Western Ethiopia (44.1%) [12] by Temesgen Tilahun et al and University of Gondar, Northwest Ethiopia (67.7%) [13] by Alem Getaneh et al. This promising finding indicates a receptivity to screening interventions and suggests that efforts to promote the importance of early detection are yielding positive outcomes.

While the attitude towards screening is encouraging, the actual uptake of screening services remains a challenge. Only 12.5% of the participants had undergone a Pap smear test at least once, indicating a gap between favourable attitudes and practical implementation. These findings are lower than the study from Qatar, where 40% of women had been screened [9]. However, it is worth noting that the percentage is higher than observed in a study conducted in Wollega University, Western Ethiopia, where none of the participants had been screened in the past three years [12].

The comparison of screening rates between developing and developed countries is striking. The estimated 5%–10% screening rate in developing countries contrasts starkly with the 40%–50% rate in developed countries. This discrepancy underscores the urgent need for targeted interventions in developing nations to bridge the gap in cervical cancer screening accessibility and utilization.

6. Conclusion

The awareness and engagement in cervical cancer screening practices among female students across various educational streams was low. However, a significant majority of these students exhibit a positive and favourable attitude towards cervical cancer screening. A multi-faceted approach that combines awareness campaigns, accessible screening services, and targeted educational programs can collectively work towards reducing the burden of cervical cancer and promoting better women's health outcomes.

References

1. NCDs. Cervical cancer awareness month 2023 [Internet]. World Health Organization - Regional Office for the Eastern Mediterranean. [cited 2023 Apr 17]. Available from: <https://www.emro.who.int/noncommunicable-diseases/campaigns/cervical-cancer-awareness-month-2023.html>
2. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* [Internet]. 2012;380(9859):2095–128. Available from: [http://dx.doi.org/10.1016/s0140-6736\(12\)61728-0](http://dx.doi.org/10.1016/s0140-6736(12)61728-0)
3. HPV and cancer [Internet]. National Cancer Institute. 2019 [cited 2023 Apr 17]. Available from: <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer>
4. WHO, UN, The World Bank, and IARC Globocan, “Cervical Cancer Global Crisis Card,” 2013, <http://www.who.int/hpvcentre/statistics/>.
5. Uniyal P. India launches first cervical cancer vaccine; why it’s important to get jabbed. *The Hindustan Times* [Internet]. 2022 Sep 11 [cited 2023 Apr 17]; Available from: <https://www.hindustantimes.com/lifestyle/health/india-launches-first-cervical-cancer-vaccine-why-it-s-important-to-get-jabbed-101662888723563.html>
6. Schiffman M, Castle PE, Jeronim J, Rodrigue AC, Wacholde S. Human papillomavirus and cervical cancer. *Lancet*. 2007; 370:890–907.
7. Sankaranarayanan R, Ferlay J. Worldwide burden of gynecological cancer: The size of the problem. *Best Pract Res Clin Obstet Gynaecol*. 2006; 20:207–25.
8. Singh N. HPV and Cervical cancer - prospects for prevention through vaccination. *Indian J Med Paediatr Oncol*. 2005; 26:20–3.
9. Al-Meer FM, Aseel MT, Al-Khalaf J, Al-Kuwari MG, Ismail MFS. Knowledge, attitude and practices regarding cervical cancer and screening among women visiting primary health care in Qatar. *East Mediterr Health J* [Internet]. 2011 [cited 2023 May 9];17(11):855–61.
10. Shimeles T. Knowledge, attitude, practice of cervical cancer screening and its associated factors among female students in Hawassa University college of medicine and health science hawassa Ethiopia: Addis Ababa University; 2015.
11. Isara A, Awunor N, Erameh L, Enuanwa E, Enofe I. Knowledge and practice of cervical cancer screening among female medical students of the University of Benin, Benin City Nigeria. *Afr J Online (AJOL)*. 2013;12(1).
12. Tilahun, T., Tulu, T. & Dechasa, W. Knowledge, attitude and practice of cervical cancer screening and associated factors amongst female students at Wollega University, western Ethiopia. *BMC Res Notes* 12, 518 (2019). <https://doi.org/10.1186/s13104-019-4564-x>
13. Getaneh, A., Tegene, B. & Belachew, T. Knowledge, attitude and practices on cervical cancer screening among undergraduate female students in University of Gondar, Northwest Ethiopia: an institution based cross sectional study. *BMC Public Health* 21, 775 (2021). <https://doi.org/10.1186/s12889-021-10853-2>