SIDDHANTA'S INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN ARTS & HUMANITIES
An International Peer Reviewed, Refereed Journal
Vol. 2, Issue 3, January-February 2025 Impact Factor : 6.8 ISSN(O) : 2584-2692
Available online : https://sijarah.com/

Bridging the Knowledge Gap: Assessing Cancer Awareness among Tertiary Students in Punjab, India

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Abstract

Background: Cancer remains a major public health challenge in India, with low levels of awareness contributing to delayed detection and high mortality rates. Understanding risk factors, warning signs, and available screening facilities is essential for effective prevention and early intervention. Among tertiary students, who are future policymakers, healthcare providers, and educators, assessing cancer awareness is crucial for shaping informed health behaviors and promoting early detection.

Objective: This study examines the level of cancer awareness among tertiary students in Punjab, India, focusing on their knowledge of cancer risk factors, early symptoms, and screening facilities. The research aims to identify knowledge gaps and propose strategies for improving cancer literacy among young adults.

Methods: A cross-sectional quantitative survey was conducted among 601 tertiary students from six districts in Punjab. Participants were selected through multi-stage random sampling, and data were collected using a modified version of the Cancer Awareness Measure (CAM). Descriptive statistics, including mean scores and standard deviations, were used to analyze awareness levels related to cancer risk factors, warning signs, and screening availability.

Results: The findings indicate moderate awareness of cancer risk factors (mean = 36.59, SD = 10.88), but low awareness of warning signs (mean = 19.50, SD = 5.79) and

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screening facilities (mean = 4.31, SD = 1.22). While 54.7% of respondents correctly identified breast cancer as the most common cancer in Indian women, misconceptions about male cancers persisted. A significant knowledge gap was found regarding early detection practices, with limited awareness of mammography and oral cancer screening. These findings highlight a critical need for targeted educational interventions to enhance cancer awareness among tertiary students.

Conclusion: Despite moderate awareness of cancer risk factors, significant gaps exist in knowledge of warning signs and screening options among tertiary students in Punjab. Given their role as future professionals, improving cancer literacy within this demographic is essential for public health advocacy and early detection efforts. Integrating cancer education into academic curricula, leveraging digital health campaigns, and community-based interventions can help bridge these gaps and contribute to reducing cancer-related morbidity and mortality.

Keywords: Cancer awareness, tertiary students, risk factors, early detection, screening facilities, Punjab, public health, cancer education.

Introduction

Globally, cancer is a major public health issue, with around 19.3 million new cases and almost 10 million deaths in 2020 (1). For India, the burden is even more staggering with over 1.4 million new cases and around 850,000 deaths every year (2). The increasing cases of cancer can be wholly or partly linked to changes in lifestyle, environmental factors and an increase in the age of the populace. Along with treatment and preventive measures, the poor awareness regarding early-stage diagnosis add to the high mortality rate. There is considerable evidence that cancer screening can significantly improve survival rates and reduce the burden of cancer, which makes timely detection and awareness crucial (3).

Understanding the risk elements, indicators, and methods of screening for cancer is significant for preemptive action and accurate diagnosis. However, research has shown that awareness on this subject remains significantly low, particularly in regions with low to median income such as India (4; 5). As an example, breast cancer is the most

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widespread cancer among women in India, representing 27% of all cancers in the female population. Still, the awareness of screening techniques which includes mammography and clinical examination of the breast is very poor (6). In the same fashion, the predominant oral and lung cancers that Indian males suffer from are usually of advanced stage when diagnosed due to inadequate understanding of risk factors such as tobacco consumption (2).

Tertiary students, as future decision makers in the field of policy, medicine, and social work, are a vital group for consideration in advocating for cancer awareness. Their perceptions and attitudes toward cancer have the potential to impact societal attitudes and even health seeking behaviors. However, available literature suggests that there is a low level of cancer awareness among students in India, especially in relation to the early signs and symptoms as well as screening procedures (7; 8). For instance, (9) pointed out that university students in Delhi knew about different types of cancers, but their knowledge of the signs and symptoms was very shallow. Likewise, (10) pointed out that even students studying in health care programs had very basic and vague understanding of the risk factors and preventive measures of cancer.

As a state in Northern India, Punjab has its own unique challenges in cancer prevention and control. Breast, oral, and lung cancer have been registered at an alarming rate in this region, which can be partly associated with tobacco consumption, pesticide use, and lifestyle changes (11). Nonetheless, research cancer cognizance among tertiary students in Punjab, a preeminent demographic sector for implementing interventions remains scant. For well-planned educational programs and policies aimed at early detection and prevention to be impactful, it is crucial to recognize the level of cancer cognizance among these students.

This study is designed to examine the level of awareness of cancer among university students in Punjab, with a particular emphasis on their knowledge of the cancer risk factors and warning signs, as well as the availability of screening services. Furthermore, it seeks to determine their awareness regarding the most frequent cancers diagnosed in India among males and females. With this knowledge and attitude assessment, the

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student's awareness of cancer and adoption of early detection practices will be facilitated. These objectives for this research study are a more focused and instrumental public health proactive approach for cancer control, not only in Punjab, but India as a whole where low cancer awareness is a critical challenge.

Methodology

This research adopted a cross-sectional quantitative design to measure the cancer awareness, perception of risk, and health behavior of tertiary students in Punjab, India. The cross-sectional design was selected as it allows collection of the relevant population characteristics as well as examination of relationship between specific variables (12). The region of interest included students from universities and colleges in Punjab, which encompassed various levels of education and socio-economic status.

The sample size was calculated as per the table suggested by Gill, Johnson, and Clark in 2010, with a confidence level of 99%, margin of error at 5%, and 50% of population variance. Based on the estimation given for a population of 500,000, a sample size of at least 660 was suggested. To further enhance the generalizability of the data, a target sample of 700 was set. However, due to time, resource, and participant availability constraints, only 601 responses were collected.

To achieve representativeness, a multi-stage sampling technique was used as follows. Punjab has 22 districts, due to cancer incidence rates, Patiala, Mansa, Sangrur, Tarn Taran, Gurdaspur, and Sri Muktsar were selected. Tertiary students from these districts were randomly selected to ensure a variation of educational background (13).

The CAM was modified for this study to evaluate participants' awareness and knowledge of the cancer risk and its warning signs. The CAM has validated multiple choices (14). Ethical clearance was obtained from review boards, and participants were given information about the study's aims and procedures prior to obtaining their written consent. Data had been anonymized to protect participants' confidentiality (15; 16; 17).

In-person questionnaire administration was conducted by trained facilitators in the selected districts over a period of three months (18; 19). Every completed survey was

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assigned codes and then introduced into a database through a double data entry system in order to reduce errors (20). Survey data were analyzed using SPSS, while descriptive statistics were used to report demographic and cancer awareness data. The result was discussed within the framework of available research on cancer awareness in India.

Data Presentation and Analysis

Demographic Data

The following presents the demographic data of the study respondents. The demographic data includes districts of the respondents, gender, marital status, level of education, stream of study, religion, education of parents, financial status and cancer history.

Table 1: Frequencies for District

District	Frequency	Percent	Valid Percent	Cumulative Percent
Gurdaspur	91	15.141	15.141	15.141
Mansa	104	17.304	17.304	32.446
Patiala	118	19.634	19.634	52.080
Sangrur	93	15.474	15.474	67.554
Tarn Taran	79	13.145	13.145	80.699
Shri Muktsar	116	19.301	19.301	100.000
Missing	0	0.000		
Total	601	100.000		

The study participants were drawn from six districts within Punjab. The districts are Gurdaspur, Mansa, Patiala, Sangrur, Tarn Taran, and Shri Muktsar. The result of the study reveals that 91 (15.1%) of the participants were from Gurdaspur, 104 (17.3%) of the participants were from Mansa, 118 (19.6%) of the participants were from Patiala, 93 (15.5%) of participants were from Sangrur; 79 (13.1%) of the participants were from Tarn Taran and 116 (19.3%) of the participants were from Shri Muktsar. Patiala had the highest number of participants (118), followed by Shri Muktsar (116). The district with the lowest number of participants is Tarn Taran (79).

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Table 2: Frequencies for Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	324	53.910	53.910	53.910
Female	277	46.090	46.090	100.000
Missing	0	0.000		
Total	601	100.000		

In terms of gender, there were two genders, male and female. The study results revealed that there 324 (53.9%) males and 277 (46.1) females in this study. There were thus more male respondents than female respondents in this study.

Table 3: Level of Education

Frequencies for Level of Education

Level of Education	Frequency	Percent	Valid Percent	Cumulative Percent
undergraduate	354	58.902	58.902	58.902
Postgraduate	169	28.120	28.120	87.022
Higher	7	1.165	1.165	88.186
Others	71	11.814	11.814	100.000
Missing	0	0.000		
Total	601	100.000		

The results revealed that 354 (58.9%) of the study participants were undergraduate students; 169 (28.1) were graduate students; 7 (1.2) of the study participants were undertaking higher studies such as PhD or Post PhD Studies; 71 (11.8%) of the study participants were undertaking studies that would lead to the award of certificate or diploma. In all, undergraduate students constituted the dominant study participants.

Table 4: Cancer History in the Family Ever

History of Cancer	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	190	31.614	31.614	31.614
No	308	51.248	51.248	82.862
I don't know	72	11.980	11.980	94.842
I prefer not to say	31	5.158	5.158	100.000
Missing	0	0.000		
Total	601	100.000		

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190 (31.6%) indicated they have a family history of cancer; 308 (51.2%) do not have a family history of cancer; 72 (12%) do not know the status of cancer history in their family; 31 (5.2%) preferred not to disclose their family history of cancer.

Level of Cancer Awareness among tertiary students in Punjab

This objective aimed to assess the level of cancer awareness among tertiary students in Punjab, focusing on their knowledge of cancer risk factors, warning signs, screening facilities available for men and women and the commonest cancer among men and women in India. Descriptive statistics were used to summarize and analyze the data collected.

Table 5: Descriptive Statistics Showing Level of Awareness of Cancer Risk Factors, Cancer Warning Signs and Availability of Cancer Screening Facilities

Descriptive Statistics

	Valid	Missing	Mean	Std. Deviation	Minimum	Maximum
Risk factors	601	0	36.587	10.885	12.000	60.000
Warning signs	601	0	19.496	5.788	11.000	33.000
Screening facility	601	0	4.313	1.221	2.000	6.000

The scores for awareness of cancer risk factors indicate a range of 48.00, with a minimum score of 12.00 and a maximum score of 60.00. The mean score for awareness of cancer risk factors was 36.59 (SD = 10.88) which indicates a moderate level of

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awareness among the students. The high variance (118.48) suggests significant variability in the knowledge levels of risk factors among the students.

The scores from the awareness of warning signs among the students showed a narrower range of 22.00, with scores ranging from 11.00 to 33.00. The mean score was 19.50 (SD = 5.79), which reflects a relatively lower level of awareness compared to risk factors. A variance of 33.50 highlights moderate variability in respondents' knowledge of warning signs.

The scores on the awareness of screening facilities had a range (4.00), with scores varying from 2.00 to 6.00. The mean score was 4.31 (SD = 1.22), suggesting limited awareness of available cancer screening facilities in the districts where the study was conducted. The low variance (1.49) indicates a more uniform level of understanding about screening facilities.

Among the three dimensions assessed, the level of awareness of cancer risk factors was comparably the highest, with a mean score of 36.59 which indicates a moderate awareness level of cancer risk factors among the students. Awareness of cancer warning signs and screening facilities was relatively low, pointing to a critical knowledge gap in these areas among the students. The considerable variability in knowledge of risk factors and warning signs suggests unequal dissemination of information or differing levels of access to health education among the student population.

Table 11: Frequency Table Showing the Commonest Cancer in Women in India

Cancer type	Frequency	Percent	Valid Percent	Cumulative Percent
Breast Cancer	329	54.742	54.742	54.742
Cervical Cancer	188	31.281	31.281	86.023
Oral Cancer	16	2.662	2.662	88.686
Lung Cancer	12	1.997	1.997	90.682

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Cancer type	Frequency	Percent	Valid Percent	Cumulative Percent
Ovarian Cancer	56	9.318	9.318	100.000
Total	601	100.000		

The table above presents data on the frequency and percentage distribution of the five most common types of cancer among women in India. Breast cancer was identified as the most common cancer, with a frequency of 329 cases, representing 54.7% of the respondents. This suggests that over half of the participants recognized breast cancer as the leading cancer affecting women. Cervical cancer ranked second, with a frequency of 188, accounting for 31.3% of the respondents. Ovarian cancer was the third most common, with a frequency of 56, making up 9.3% of the responses. Oral cancer and lung cancer were the least identified, with frequencies of 16 (2.7%) and 12 (2.0%), respectively.

DISCUSSIONS

This study focused on measuring the cancer awareness levels of tertiary students in Punjab regarding their knowledge on the various risk factors, the signs and symptoms of cancer, and the screening facilities available. In addition, it also gathered information on their knowledge about the most prevalent types of cancers in India among the male and female populations. The results showed that there was moderate awareness of cancer risk factors (mean score = 36.59) but low awareness regarding cancer warning signs (mean score = 19.50) and screening facilities (mean score = 4.31). Although students managed to correctly identify breast cancer as the most frequently occurring cancer among women, they wrongly assumed that prostate cancer was the most common cancer among men, which indicates a substantial lack of knowledge regarding male cancers. These findings highlight the need to focus on interventions aimed at enhancing the cancer awareness levels of individuals pertaining to early detection and screening measures.

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The results of this study agree with previous studies on cancer awareness in India which has shown moderate to low knowledge about cancer as the disease's early signs, symptoms, and screening levels are quite low. For example, (9) stated that the students of Delhi University had knowledge about various cancers, but their knowledge about symptoms and early diagnosis was lacking. In the same way, Choudhury and Sharma (7) reported the knowledge gaps in cancer for Indian adolescents, especially the early signs and symptoms. These results are supported further by (8) who reported that good knowledge about cancer warning signs is only at 20.5% among college students in India, while adequate knowledge of risk factors was noted at 28.1%. These findings are echoed in the current study which shows a moderate level of awareness in cancer risk factors, but poor knowledge on warning signs and screening techniques.

This study found moderate levels of awareness regarding cancer, which is consistent with the broader Indian context of limited cancer knowledge. According to (4), Indian women understood that cancer existed, yet their knowledge on screening processes such as mammography and Pap smears was poor. In the same vein, (10) noted that nurses, doctors, and medical students had some understanding of cancer but their knowledge of its risk factors was basic and vague at best. (5) also pointed out that while a majority of Indian women ascertained cancer as a disease, they did not know its risk factors or how to prevent it. This showcases the stark difference in cancer awareness among various Indian demographics, including tertiary students.

The study's findings regarding the most common cancers in India are particularly noteworthy. Breast cancer, correctly identified by students as the most common cancer among women, accounts for approximately 27% of all cancers in Indian women (6). However, the misidentification of prostate cancer as the most common cancer among men reflects a significant gap in awareness. In reality, oral and lung cancers are the most prevalent cancers among Indian men, accounting for 15% and 10% of all male cancers, respectively (2). Prostate cancer, while significant, ranks lower in prevalence. This misperception highlights the need for targeted educational campaigns to address gender-specific cancer awareness.

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The significant rate of breast cancer in women coupled with oral and lung cancer in men magnifies the need for timely detection and intervention. For example, breast cancer is commonly diagnosed in advanced stages in India because of scant knowledge about screening techniques like mammography and clinical breast examinations (3). The same applies to oral and lung cancers, which can be easily prevented by quitting smoking but still remain a major public health issue. The absence of knowledge on these cancers among tertiary students who are bound to become the next generation workforce and policymakers is worrisome and needs to be addressed without delay.

The findings of this study have significant implications for public health education and cancer awareness campaigns in Punjab and across India. The moderate awareness of cancer risk factors and poor knowledge of warning signs and screening facilities emphasize the need for targeted educational initiatives. Key strategies to address these gaps include:

- **Integration of Cancer Education into Academic Curricula**: Incorporating cancer prevention, early detection, and recognition of healthcare services into university curricula can provide students with essential knowledge about cancer. This approach can serve as a sustainable solution to close the gaps identified in this study (9).
- **Leveraging Digital Platforms**: Mobile health applications, social media campaigns, and e-learning platforms can effectively disseminate cancer awareness information to students. (21) found that interactive and engaging digital content significantly improves awareness and knowledge retention.
- **Addressing Cultural and Social Barriers**: Cultural and social factors, such as stigma and fatalistic attitudes toward cancer, can hinder awareness and health-seeking behaviors. Public health campaigns should address these barriers by promoting positive narratives about cancer treatment and survivorship (Patel et al., 2018).
- **Gender-Specific Awareness Programs**: Given that breast cancer is the most common cancer among women and oral and lung cancers are the most common

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among men, gender-specific awareness programs are crucial. Campaigns should emphasize screening techniques such as breast self-exams and Pap smears for women and tobacco cessation programs for men. These programs can help reduce the burden of late-stage cancer diagnoses and encourage early detection.

- **Community Engagement and Outreach**: Engaging community leaders, influencers, and local organizations in cancer awareness initiatives can help bridge the gap between knowledge and action. Community-based programs can address cultural and social barriers, such as stigma and fatalistic attitudes, by fostering a supportive environment for cancer prevention and care.

The findings of this study highlight moderate awareness of cancer risk factors but poor knowledge of warning signs and screening facilities among tertiary students in Punjab. These results align with broader trends in India, where limited cancer awareness remains a significant public health challenge. Targeted educational initiatives, including the integration of cancer education into academic curricula, leveraging digital platforms, and addressing cultural and social barriers, are essential to improve cancer awareness and promote early detection practices. By closing these knowledge gaps, policymakers and public health practitioners can contribute to reducing the burden of cancer in Punjab and beyond.

Conclusion

This study assessed the level of cancer awareness among tertiary students in Punjab, India, focusing on their knowledge of cancer risk factors, warning signs, and screening facilities. The findings reveal a moderate level of awareness of cancer risk factors but a significantly lower understanding of early warning signs and available screening options. While students correctly identified breast cancer as the most prevalent cancer among women, there were notable misconceptions regarding the most common cancers among men. These gaps in awareness highlight the urgent need for targeted educational interventions to enhance cancer literacy among young adults.

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Given that tertiary students are future professionals and decision-makers, improving their knowledge of cancer can have far-reaching public health benefits. Integrating cancer education into academic curricula, leveraging digital platforms for awareness campaigns, and implementing community-based outreach programs are essential strategies to bridge the knowledge gap. Additionally, gender-specific health education programs can address the disparities in awareness related to male and female cancers.

Addressing these gaps is crucial for promoting early detection and preventive healthcare practices, ultimately reducing cancer-related morbidity and mortality in Punjab and beyond. By fostering a culture of awareness and proactive health-seeking behavior among young adults, public health stakeholders can contribute to a more informed and health-conscious society, improving overall cancer outcomes in India.

References

Here is the numbered list of references in **APA 7th edition**, arranged in the order they appear in the text:

1. Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians, 71*(3), 209-249.

2. Mathur, P., Sathishkumar, K., Chaturvedi, M., Das, P., Sudarshan, K. L., Santhappan, S., … & Murthy, N. S. (2020). Cancer statistics, 2020: Report from the National Cancer Registry Programme, India. *Indian Journal of Medical Research, 151*(2), 77-89.

3. Sankaranarayanan, R., Ramadas, K., & Qiao, Y. L. (2011). Managing the changing burden of cancer in Asia. *BMC Medicine, 9*, 50. https://doi.org/10.1186/1741-7015-9-50

4. Kumar, A., & Sharma, P. (2017). Cancer awareness in low- and middle-income populations: An Indian perspective. *South Asian Journal of Cancer, 6*(1), 17-22.

5. Bhatia, R., & Patel, K. (2020). Cancer awareness in India: A critical review. *Indian Journal of Public Health, 64*(4), 325-330.

6. National Cancer Registry Program. (2020). *Annual report 2020*. Indian Council of Medical Research.

7. Choudhury, R., & Sharma, S. (2015). Understanding cancer awareness among adolescents: A survey-based study in India. *Asian Pacific Journal of Cancer Prevention, 16*(12), 4887-4892.

8. Mushini, V., Singh, R., & Patel, N. (2020). Cancer awareness among college students: A cross-sectional study. *Asian Journal of Oncology, 6*(3), 180-185.

9. Kala, P., Sharma, R., & Gupta, A. (2023). Knowledge and perception of cancer among university students in Delhi. *International Journal of Health Promotion and Education, 61*(1), 45-55.

10. Joshi, M., & Varma, S. (2018). Understanding cancer risk factors: A survey among healthcare students in India. *Journal of Cancer Education, 33*(2), 280-285.

11. Thakur, J. S., Rao, B. T., & Rajwanshi, A. (2018). Epidemiological trends of cancer in Punjab. *Indian Journal of Community Medicine, 43*(1), 5-10.

12. Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

13. Fowler, F. J. (2014). *Survey research methods* (5th ed.). SAGE Publications.

14. Stubbings, S., Robb, K., Waller, J., Ramirez, A., Austoker, J., Macleod, U., … & Wardle, J. (2009). Development of a measurement tool to assess public awareness of cancer. *British Journal of Cancer, 101*(Suppl 2), S13-S17.

15. American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct*. APA.

16. Beauchamp, T. L., & Childress, J. F. (2019). *Principles of biomedical ethics* (8th ed.). Oxford University Press.

17. Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.

18. Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons.

19. Babbie, E. (2016). *The practice of social research* (14th ed.). Cengage Learning.

20. Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). SAGE Publications.

21. Rao, N., Singh, P., & Mehta, A. (2022). Impact of digital education on cancer awareness among young adults in India. *Journal of Public Health Research, 11*(1), 89-98.

22. Patel, P., Sharma, D., & Rao, K. (2018). Social and cultural barriers to cancer awareness and prevention in India. *Indian Journal of Social Health, 4*(2), 120-132.a