

Knowledge, Attitude, and Practice Regarding Oral Cancer among Medical Students in Nepal: A Descriptive Cross-sectional Study

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Abstract

Introduction: Medical students, in the formative stage of their training, are integral to early oral cancer detection and prevention. However, gaps in their knowledge, attitudes, and practices can hinder effective screening and education. This study was conducted to assess the knowledge, attitudes, and practices regarding oral cancer among third-year medical students at a medical college in Nepal

Methods: A cross-sectional study was conducted from September 2024 to October 2024 among 252 third-year medical students. Data were collected using a structured questionnaire from google web form assessing demographic characteristics, knowledge, attitudes and practices regarding oral cancers. Descriptive statistics were used to present the data using Statistical Package for the Social Sciences version 21.0.

Results: Out of 252 students, 246 (97.62%) correctly identified tobacco as a primary risk factor for oral cancer, 37 (14.68%) recognized sun exposure as a risk factor, and 51 (20.24%) were unsure about recommended screening frequencies. A misconception that oral cancer affects only those over 50 years was held by 34 (13.49%) of respondents, while 98 (38.89%) were unaware of the survival benefits of early detection. Regarding the attitude, 208 (82.54%) agreed that early detection improves outcomes, and 200 (79.37%) supported the inclusion of routine screening in medical examinations. The mean overall attitude score was 34.01 ± 4.06 out of a maximum score of 45, indicating generally favorable attitudes toward oral cancer prevention and early detection. Only 111 (44.05%) felt confident educating patients, and 178 (70.64%) were neutral or dissatisfied with their training adequacy.

Conclusions: Although medical students demonstrate sound baseline knowledge and positive attitudes toward oral cancer, substantial knowledge gaps and limited self-confidence in practical application persist.

Keywords: medical students; Nepal; oral cancer.

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Introduction

Oral cancer is a significant global public health problem and contributes substantially to cancer-related morbidity and mortality.¹ Tobacco use is the main risk factor, also alcohol consumption, betel quid chewing, and human papillomavirus (HPV) infection play important roles.^{2,3} Despite advances in diagnosis and treatment, many patients continue to present at advanced stages, resulting in poorer outcomes and reduced survival.⁴ Therefore, early detection and timely intervention are essential.⁵

Medical students represent future frontline healthcare providers who may encounter patients with early signs and risk factors of oral cancer during clinical practice. Adequate knowledge, positive attitudes, and appropriate preventive practices are important for promoting patient education, conducting opportunistic screening, and facilitating timely referral. However, deficiencies in these areas may limit their preparedness to contribute effectively to oral cancer control.

This study assessed the knowledge, attitudes, and practices regarding oral cancer among third-year medical students in a medical college in Nepal. The results may show educational gaps and help improve the curriculum.

Methods

A cross-sectional, descriptive study was conducted at Birat Medical College Teaching Hospital (BMCTH), Morang, Nepal, from September 2024 to October 2024. The study population comprised third-year medical students who had recently completed their preclinical training.

Ethical approval was obtained from the Institutional Review Committee of Birat Medical College Teaching Hospital (Ref: IRC-PA-409/2024). Participation was voluntary, and informed consent was obtained from all participants. Data were collected anonymously, and confidentiality was strictly maintained. All third-year medical students who consented to participate were included in the study, while those who declined consent or submitted incomplete responses were excluded.

Data were collected using a structured, self-administered questionnaire developed for this study after an extensive review of previously published literature on Knowledge, Attitudes, and Practices (KAP) regarding oral cancer among healthcare students. The questionnaire included items adapted from previously published studies, along with additional items developed by the investigators to align with the study objectives and local context.

The draft questionnaire was reviewed by

faculty members from the Department of Otorhinolaryngology and Head-Neck Surgery for content relevance, clarity, and appropriateness. Based on their feedback, minor modifications were incorporated before finalization. Also, a pilot study among 15 students were conducted. The questionnaire consisted of 30 items divided into three domains: knowledge (10 items), attitude (10 items), and practice (10 items). In each domain, nine structured questions were included for quantitative analysis, while one additional open-ended question invited participants to provide further comments. Responses to the open-ended questions were reviewed descriptively but were not included in the quantitative analysis because of the limited number of responses.

The validated questionnaire was distributed electronically using Google Forms. Participants were informed about the study objectives prior to participation. Responses were collected anonymously and stored securely for analysis. Data were analyzed using Statistical Package for the Social Science version 21.0.

The attitude domain consisted of nine structured statements assessed using a 5-point Likert scale ranging from strongly disagree to strongly agree, along with one optional open-ended question. For overall assessment, responses to the nine Likert-scale statements were summed to generate a composite attitude score ranging from 9 to 45. Attitude responses were analyzed both item-wise and as an overall score. No categorical classification of attitude (e.g., positive, neutral, or negative attitude) was performed.

Results

A total of 252 medical students participated in the study assessing knowledge, attitudes, and practices regarding oral cancer. Table 1 presents the demographic characteristics of the participants. The age of the participants ranged from 20 to 26 years, with a mean age of 22.3 ± 1.20 years. The largest age group was 22-23 years, comprising 160 (63.49%) participants. Of the respondents, 123 (48.81%) were male, 128 (50.79%) were female, and 1 (0.40%) did not specify their gender. Previous medical or dental education beyond the regular curriculum was reported by 68 (26.98%) participants, while 182 (72.22%) reported no such exposure. Participation in oral cancer seminars or workshops was reported by 18 (7.14%) participants, whereas 234 (92.86%) had not attended any such programs previously.

Table 1: Demographic distribution of participants (n= 252).

Characteristics		n (%)
Gender	Male	123 (48.81)
	Female	128 (50.79)
	Unspecified	1 (0.40)
Age (Years) Range 20-26	Mean±SD (22.30±1.20)	
	20-21 Years	48 (19.05)
	22-23 Years	160 (63.50)
	24-25 Years	30 (11.90)
	>26 Years	5 (1.98)
	Unspecified	9 (3.57)
Participants with previous medical or dental education	Yes	68 (26.99)
	No	182 (72.22)
	Unspecified	2 (0.79)
Participants who have participated in any oral cancer seminars or workshops previously	Yes	18 (7.14)
	No	234 (92.86)

Knowledge About Oral Cancers

The majority of participants identified tobacco use as a risk factor for oral cancer 246 (97.62%). Other risk factors identified included poor oral hygiene, alcohol consumption, and HPV infection. Sun exposure was identified by only 37 (14.68%) participants. Regarding diagnosis, 212 (84.13%) identified biopsy, 174 (69.05%) oral examination, 127 (50.40%) imaging, and 85 (33.73%) blood tests as methods used for oral cancer evaluation (Table 2).

Table 2: Knowledge of medical students regarding oral cancer risk factors, screening, and diagnosis (n = 252).

Knowledge Area / Item	Response n (%)
Identified Risk Factors	
Tobacco as a risk factor	246 (97.62)
HPV infection	125 (49.60)
Alcohol	116 (46.03)
Poor oral hygiene	91 (36.11)
Sun exposure	37 (14.68)
Identified Diagnostic/Screening Tools	
Biopsy as a diagnostic tool	212 (84.13)
Oral Examination	174 (69.05)
Imaging	127 (50.40)
Blood test	85 (33.73)

A total of 34 (13.49%) participants incorrectly reported that oral cancer affects only individuals

over 50 years of age. Fifty-one (20.24%) reported not knowing the recommended screening frequency in the general population, and regarding survival benefits associated with early detection, 98 (38.89%) participants reported “I don’t know”.

Attitudes Toward Oral Cancer

Students rated various statements on a 1-5 Likert scale (1= strongly disagree, 3= neutral, 5= strongly agree). The highest mean score of 4.25 was observed for the statement “Oral cancer screening should be a routine part of medical examinations,” in which 64 (25.40%) students marked “strongly agree” and 144 (57.10%) students marked “agree”. Attitude responses were analyzed both as an overall composite score (Table 3) and as frequency distributions for individual statements (Table 4). The mean overall attitude score among participants was 34.01±4.06 out of a maximum score of 45, indicating generally favorable attitudes toward oral cancer prevention and early detection.

Table 3: Overall attitude score regarding oral cancer among medical students (n = 252).

Variable	Value
Mean attitude score (maximum score= 45)	34.01±4.06
Median (IQR)	34 (32-36)
Range	19-45

Table 4: Responses to questions designed to evaluate the attitudes (n=252).

Question/statement	Responses n (%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Oral cancer screening should be a routine part of medical examinations.	4 (1.59)	6 (2.38)	34 (13.49)	144 (57.14)	64 (25.40)
2. I believe that early detection of oral cancer significantly improves treatment outcomes.	4 (1.59)	5 (1.98)	22 (8.73)	116 (46.03)	105 (41.67)
3. I feel confident in my ability to educate patients about oral cancer prevention.	5 (1.99)	27 (10.76)	108 (43.03)	91 (36.26)	20 (7.97)
4. I think my medical training has adequately prepared me to address oral cancer in clinical practice.	10 (3.97)	54 (21.43)	114 (45.24)	66 (26.19)	8 (3.17)
5. I believe that oral cancer is a significant health concern that requires more attention in medical education.	3 (1.20)	5 (1.99)	37 (14.74)	155 (61.75)	51 (20.32)
6. I am likely to recommend oral cancer screenings to my future patients.	-	4 (1.59)	41 (16.33)	162 (64.54)	44 (17.53)
7. I believe that patients often do not understand the risks associated with oral cancer.	2 (0.80)	11 (4.42)	45 (18.07)	164 (65.86)	27 (10.84)
8. I think more awareness programs about oral cancer should be conducted in the community.	1 (0.40)	2 (0.80)	23 (9.16)	136 (54.18)	89 (35.46)
9. I believe my peers are knowledgeable about oral cancer and its prevention	3 (1.20)	24 (9.60)	95 (38)	110 (44)	18 (7.20)

Practices Regarding Oral Cancer

Out of 252 participants, 80 (31.75%) reported never performing a clinical oral examination during clinical rotations, while 79 (31.35%) reported rarely performing it. When encountering patients with suspicious oral symptoms, the most commonly reported responses included performing an oral examination, referring to a specialist, and providing patient education. Regarding communication practices, 75 (29.76%) reported rarely discussing oral health and oral cancer prevention with peers or patients, while 127 (50.40%) reported doing so sometimes (Table 5). Access to clinical resources such as screening guidelines and educational materials was reported as limited by a majority of participants.

Table 5: Practices and communication behaviors related to oral cancer among medical students (n = 252).

Practice item	Response n (%)
Never performed oral examination	80 (31.75)
Rarely performed examination	79 (31.35)
Discuss oral cancer sometimes	127 (50.40)
Rarely discuss prevention	75 (29.76)

Discussion

This study assessed knowledge, attitudes, and

practices regarding oral cancer among third-year medical students in Nepal. Overall, students demonstrated a satisfactory theoretical foundation; however, a clear gap between knowledge and clinical application was observed, particularly in preventive practices and communication skills. This discordance highlights an important weakness in undergraduate medical training that requires curricular attention.

In the present study, most participants correctly identified tobacco as a major risk factor for oral cancer. This finding is consistent with global evidence, where tobacco is recognized as the leading etiological factor, particularly in low- and middle-income countries (LMICs), contributing to a substantial proportion of oral cancer cases.⁴ Similar findings have been reported among medical students in Nepal by Shrestha et al., where tobacco was the most commonly recognized risk factor.⁵ Comparable results have also been reported in studies from South Asia and the Middle East, suggesting a generally consistent baseline awareness among medical students globally.^{6,7} However, awareness of other important risk factors such as sun exposure was markedly low in the present study (14.68%), which is also reflected in previous studies where non-traditional or less emphasized risk factors were poorly recognized, including betel quid chewing and areca nut use.^{3,8} This suggests that undergraduate teaching may disproportionately emphasize tobacco-related carcinogenesis while underrepresenting multifactorial etiologies of oral cancer.

Although most students identified biopsy as the gold standard diagnostic tool (84.13%), a notable proportion also relied on non-specific modalities such as imaging and blood tests, indicating partial understanding of diagnostic pathways. Similar patterns have been reported in previous studies, where students demonstrated reasonable awareness of diagnosis but lacked clarity regarding definitive diagnostic procedures and clinical workflow integration.^{5,9}

The present study also identified important gaps in knowledge regarding epidemiology and prognosis. A proportion of students incorrectly believed that oral cancer occurs predominantly after 50 years of age (13.49%), while a substantial proportion were unaware of survival benefits associated with early detection (38.89%). These findings are comparable to previous studies, where misconceptions regarding age distribution and prognosis have been consistently reported among medical students.^{3,5,10} This reflects insufficient reinforcement of clinical epidemiology and cancer awareness during early medical education.

Attitudes toward oral cancer were generally positive, which was also reflected by the relatively high overall attitude score observed among participants. Most students agreed that early detection improves outcomes and that oral cancer screening should be incorporated into routine medical examinations. This aligns with findings from other studies showing favorable attitudes among medical students despite variable knowledge levels.⁶ However, self-reported confidence in patient education and clinical screening was limited, with a substantial proportion of students reporting only moderate or low confidence. This gap between positive attitude and low self-efficacy has also been reported in other LMIC-based studies, indicating a persistent training deficit in applied clinical communication and preventive oncology.^{7,11}

When compared with international evidence, the findings of this study are consistent with a systematic review by Escoto-Vasquez et al., which demonstrated good baseline knowledge of tobacco as a risk factor but significantly lower awareness of other etiological factors such as HPV infection, ultraviolet radiation, and alcohol consumption.³ The WHO Global Oral Health Status Report further emphasizes that such gaps are particularly concerning in LMICs, where healthcare systems rely heavily on general physicians for early detection and referral due to limited specialist availability.^{4,12}

A particularly important finding in this study was the poor translation of knowledge into clinical practice. A significant proportion of students reported never or rarely performing oral examinations and

infrequently discussing oral cancer prevention with patients. Similar deficiencies in clinical exposure and communication skills have been reported in studies from Nepal and other developing countries.^{5,9,12-14} This suggests that theoretical knowledge alone is insufficient unless reinforced with structured clinical exposure and skill-based training.

Another important observation was the reported lack of access to clinical guidelines and screening resources during training. This structural limitation has not been widely explored in previous KAP studies, making it a potentially important contextual finding of this study. The absence of standardized clinical tools may contribute to reduced confidence and limited practical engagement among students, despite adequate theoretical knowledge.

These findings highlight several unanswered questions. It remains unclear whether early integration of structured oral cancer modules into preclinical years would significantly improve clinical practice behavior. Additionally, the effectiveness of simulation-based training, interprofessional education with dental students, and community-based screening exposure in improving competency remains underexplored in this context. Previous educational intervention studies have demonstrated that structured training programs can significantly improve oral cancer knowledge, confidence, and screening practices among healthcare students.¹⁵ Future longitudinal studies and interventional trials are needed to evaluate whether targeted educational reforms can translate knowledge into sustained clinical behavior change.

From a broader perspective, the transition from knowledge acquisition to clinical competence appears incomplete in the current medical curriculum. Strengthening early clinical exposure, incorporating reflective learning, and integrating preventive oncology modules may help bridge this gap. Given that students are in a formative stage of professional development, early reinforcement of preventive practices may have long-term implications for future healthcare delivery.

The study has some limitations. Firstly, it was conducted in a single medical institution, which may limit the generalizability of the findings to other medical colleges in Nepal. Second, the use of a self-reported questionnaire introduces the possibility of response and recall bias. Third, the cross-sectional design limits the ability to infer causality between knowledge, attitude, and practice variables. Finally, clinical competence was not objectively assessed, and responses may not fully reflect actual clinical behavior.

Conclusions

This study assessed the knowledge, attitudes, and practices regarding oral cancer among third-year medical students in a medical college in Nepal. The findings demonstrated that students had generally good knowledge of major risk factors such as tobacco use and showed positive attitudes toward the importance of early detection and oral cancer screening. However, important gaps were identified in specific areas of knowledge, particularly regarding less recognized risk factors, screening recommendations, and survival benefits of early detection. In addition, practical exposure was limited, with many students reporting infrequent performance of oral examinations and limited communication regarding oral cancer prevention in clinical settings. These findings indicate a disparity between theoretical knowledge and clinical practice among medical students, highlighting areas where undergraduate medical education may be strengthened to improve competency in oral cancer prevention and early detection.

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