ISSN: 2091-2749 (Print)
2091-2757 (Online)

Submitted on: 23 Nov 2025
Accepted on: 29 Dec 2025

https://doi.org/10.3126/jpahs.v12i2.88963

Oral health knowledge, attitude, and practices among patients visiting a tertiary care center

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Abstract

Introduction: Oral health is a critical component of overall well-being. Its neglect can contribute not only to dental diseases but also to systemic complications, increasing the burden on individuals and healthcare systems. Assessing patients' knowledge, attitudes, and practices is therefore essential to identify existing gaps and inform the development of evidence-based preventive strategies and public health interventions aimed at achieving sustainable improvements in oral health outcomes.

Method: A descriptive cross-sectional study was carried out among patients attending the dental department of Patan Hospital from 23 June 2025 to 25 July 2025. Data were collected using a structured, self-administered questionnaire assessing oral health knowledge, attitudes, and practices. Responses were categorized and scored, with levels classified according to Bloom's cut-off criteria. Descriptive statistics, chi-square tests, and Pearson correlation analyses were performed using SPSS version 23.

Result: Of the 324 participants, 21.9% demonstrated high knowledge, 48.7% had moderate knowledge, and 29.4% had low knowledge of oral health. Regarding attitude, the majority expressed positive perceptions. For practice, only 29.9% reported good oral health behaviors, 44.1% had fair practices, and 25.9% exhibited poor practices. No significant association was observed between gender and KAP levels. However, knowledge and attitude scores showed a significant positive correlation with oral health practice ($p < 0.001$).

Conclusion: Although participants demonstrated moderate knowledge and, positive attitudes toward oral health, gaps in daily practices persist. The observed associations between knowledge, attitude, and practice highlight the importance of targeted educational and behavioral interventions to improve oral health outcomes.

Keyword: Attitude; Caries; Knowledge; Oral health; Practices

How to Cite: KC M, Gurung J, Thapa S, Maharjan A. Oral health knowledge, attitude, and practices among patients visiting a tertiary care center. J Patan Acad Health Sci. 2025 Dec;12(2):49-55.

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Introduction

Oral health is multifaceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex.[1]

Understanding dental health promotes positive behavior and empowers individuals to protect their well- being. Numerous studies have demonstrated connections between improved oral hygiene and health-related behaviors and a greater understanding of oral health.[2] Two important oral diseases, periodontitis and dental caries, are seen to affect 60% and 36% of people worldwide.[3]

In Nepal, the prevalence of caries is found to be 64% in urban area and 78% in rural population whereas approximately 31% of age group 35–44 years have a deep periodontal pocket.[4] However, in a study conducted at Nepalese army Institute of Health Sciences, Nepal knowledge about dental caries is reported to be comparatively higher in medical students as, on an average 88% of MBBS students and 84.62% of nursing students had good knowledge about dental caries.[5]

Oral health knowledge is reported to be poor in various parts of Nepal.[4] This study aims to assess the oral health knowledge, attitude and practices among patients visiting the dental OPD of Patan Hospital. It seeks to determine if similar conditions exist locally, identify gaps, understand influencing factors, and guide targeted interventions to improve oral health awareness through effective oral health education strategies, aligned with the specific needs and behaviors of this population.

Method

After the ethical approval was obtained from the Institutional Review Committee (Ref. drs2506202033) of Patan Academy of Health Sciences, a descriptive cross-sectional study was conducted among patients visiting dental department of Patan Hospital located in Lalitpur, Nepal from 23 June 2025 to 25 July 2025. All adult patients aged 18 and above who can give written consent were eligible to participate in the study while patients with mental disabilities, lack of hand dexterity, edentulous patients who do not have any tooth were excluded. Patients were informed about the study and asked about their permission to participate in the study. The participation of the patient was completely voluntary. Every detail of the patients was kept confidential as the information was limited only to the principal investigator and authorized member of the research team and there was no access of information to the third party. They were called to a separate room and asked to fill up the consent form at the beginning followed by a questionnaire. Time taken for each participant was 10-15 minutes.

The self-administered questionnaire was adopted from a previously published study[6] and reviewed by the faculty members of the dental department at Patan Hospital to assess its content validity. An item-by-item review of the original questionnaire was performed. Minor wording modifications were made to selected items to improve clarity and comprehension for the study population without altering their original meaning. In addition, the response format for the attitude-related items was modified from a 5-point Likert scale to an agree/disagree/don't know format. Items that were not relevant to the objectives of the present study population were excluded. To evaluate face validity, questionnaire was pretested among 5% of the total sample size. According to the participants, the questionnaire was clear and easy to understand. Following the pretest, the questionnaire was reviewed again by the dental faculties to ensure its clarity and relevance. The questionnaire was in both English and Nepali format and comprised of two sections. Section A had a demographic information of participants including age and gender. Section B had questionnaire divided into oral health knowledge, attitude and practices which consisted of 26 questions altogether (11 knowledge items, 8 attitude items, and 7 practice items). The questionnaire was in the form of multiple-choice questions and yes/no type. The participants were asked to respond to each item according to the response provided in the questionnaire. All knowledge and attitude statements were positively worded. The knowledge-related items were in yes/no/don't know format, and the attitude-related items were assessed using agree/disagree/don't know response options. Practice-related items were assessed using a 5-point frequency scale.

Each knowledge question was scored as 1 for a correct response ("Yes") and 0 for an incorrect or "Don't know" response. Similarly, for attitude questions, 1 point was assigned for a positive response ("Agree") and 0 for negative or "Don't know" response. For the practice related questionnaire, each response was assigned a specific score point according to the direction of the behavior. Positive oral health behaviors were scored from 1 (Never) to 5 (Always), while negative behaviors were reverse scored from 5 (Never) to 1 (Always). The total practice score ranged from 7 to 35, with higher scores indicating better oral health practices. Total scores for each participant were calculated by summing individual item scores. To standardize the results, the raw total score was converted into a percentage of the maximum possible score and classified using Bloom's cut-off criteria: score 80%-100% of total points were categorized as

having high level knowledge, positive attitude, good practice whereas score 60%-79% were categorized as having moderate level knowledge, neutral attitude, fair practice and score less than 60% were categorized as having low level knowledge, negative attitude, poor practice.[7] For practical reporting, raw scores were rounded to the nearest whole number corresponding to these categories.

A sample size 324 was calculated using sample size formula:

Sample Size (N) = Z^2 X p X q/ e^2
p = 0.699 (69.9%)[8],
q = 0.301,
Z = 1.96 (for 95% confidence level) and
e = 0.05 (5% margin of error).

Patients were selected using a convenience technique. Statistical analysis was conducted using SPSS software version 23. Descriptive statistics (frequencies and percentages) were used to summarize participants' demographic characteristics and responses. Inferential analyses were also conducted. Chi-square tests of independence were applied to assess associations between gender and Bloom's cut-off–based levels of knowledge, attitude, and practice. Pearson correlation analysis was used to examine relationships between continuous total scores of knowledges, attitude, and practice. A p-value of <0.05 was considered statistically significant.

Result

Among the 324 participants, 184(56.8%) were female and 140(43.2%) were male. This indicates a slightly higher representation of female respondents in the study population.

The study assessed participants' knowledge on 11 oral health-related statements. The frequency and percentage of correct, incorrect, and uncertain responses were recorded, Table 1. The majority of participants demonstrated good knowledge regarding common oral health concepts. However, knowledge was lower for some aspects, such as the identification of dental plaque where only 41.7% of participants answered correctly, and the benefits of replacing missing teeth with 49.1% correct responses.

A total of 11 knowledge-related questions were administered, with each participant able to score between 0 and 11. For each correct response, one point was awarded, while incorrect or "Don't know" responses received zero points. Based on the total scores, participants' knowledge levels were categorized into three groups: high knowledge (80-100%, moderate knowledge (60-79%), and low knowledge (<60%). According to this classification, 71(21.9%) participants demonstrated high knowledge, 158(48.7%) participants had moderate knowledge, and 95(29.4%) participants exhibited low knowledge, Table 1.1.

A total of eight attitude-related questions were used to assess participants' perceptions towards oral health. For the statement *"I believe that brushing teeth twice a day improves oral hygiene,"* 298(92.0%) participants responded "Agree," while only 6(1.9%) responded "Disagree," and 20(6.2%) reported "Don't know." Similarly, 297(91.7%) participants agreed that maintaining clean and healthy teeth benefits overall health. In contrast, comparatively lower agreement was observed for the statement regarding fluoridated toothpaste preventing tooth decay (47.2%). Across all

Table 1. Knowledge on oral health among participants (N= 324)

SN	Statements	Yes n(%)	No n(%)	Don't Know n(%)
1.	There are two sets of teeth during lifetime.	219(67.6)	11(3.4)	94(29.0)
2.	Tooth infection can sometimes lead to pus discharge from the gum.	262(80.9)	10(3.1)	52(16.0)
3.	Replacement of missing tooth can help maintain better oral hygiene.	159(49.1)	54(16.7)	111(34.3)
4.	Decayed baby teeth do require treatment.	214(66.0)	55(17.0)	55(17.0)
5.	Bacteria can cause gum (gingival) problems.	252(77.8)	6(1.9)	66(20.4)
6.	Soft drinks affect the teeth adversely.	202(62.3)	34(10.5)	88(27.2)
7.	Loss of teeth can interfere with speech.	241(74.4)	30(9.3)	53(16.4)
8.	Irregularly placed teeth can be moved into correct position by dental treatment.	231(71.3)	21(6.5)	72(22.2)
9.	Decayed teeth can affect the appearance of a person.	259(79.9)	28(8.6)	37(11.4)
19.	Tobacco chewing, or smoking can cause oral cancer.	290(89.5)	5(1.5)	29(9.0)
11.	White layer on teeth that can be removed by brushing is called dental plaque.	135(41.7)	28(8.6)	161(49.7)

Table 1.1. Level of knowledge

Knowledge Status	Score Range (%)	Frequency n (%)
High Knowledge	80-100	71(21.9)
Moderate Knowledge	60-79	158(48.7)
Low Knowledge	<60	95(29.4)
Total	—	324(100.0)

Table 2. Attitude towards oral health among participants (N= 324)

SN	Statements	Agree n(%)	Disagree n(%)	Don't Know n(%)
1	I believe that brushing teeth twice a day improves oral hygiene	298(92.0)	6(1.9)	20(6.2)
2	I believe that maintaining clean and healthy teeth benefits overall health	297(91.7)	2(0.6)	25(7.7)
3	I believe that improper brushing can lead to gum disease	205(63.3)	36(11.1)	83(25.6)
4	I believe that retention of sweets can lead to tooth decay	264(81.5)	17(5.2)	43(13.3)
5	Brushing with fluoridated toothpaste can prevent tooth decay in my opinion	153(47.2)	20(6.2)	151(46.6)
6	I believe that dentists focus on both treatment and prevention of diseases	274(84.6)	10(3.1)	40(12.3)
7	I believe that bleeding gums can be a sign of gum infection	247(76.2)	9(2.8)	68(21.0)
8	I believe that professional dental scaling(cleaning) is not harmful to gums	167(51.5)	27(8.3)	130(40.1)

Table 2.1. Level of attitude

Attitude Level	Score Range n (%)	n (%)
Positive Attitude	80–100	216(66.70)
Neutral Attitude	60–79	79(24.40)
Negative Attitude	<60	29(8.90)
Total	—	324(100.00)

Table 3. Practice-related questionnaire (N= 324)

SN	Practice-Related Questions	Always n(%)	Very Often n(%)	Occasionally n(%)	Seldom n(%)	Never n(%)	Total n(%)
1	I give importance to my teeth as much as any part of my body	200(61.7)	49(15.1)	38(11.7)	22(6.8)	15(4.6)	324(100.0)
2	I experience tooth sensitivity due to vigorous brushing or nighttime grinding	48(14.8)	52(16.0)	135(41.7)	50(15.4)	39(12.0)	324(100.0)
3	I brush my teeth twice a day	171(52.8)	51(15.7)	51(15.7)	31(9.6)	20(6.2)	324(100.0)
4	I use my teeth to open bottle caps or similar items	7(2.2)	8(2.5)	81(25.0)	80(24.7)	148(45.7)	324(100.0)
5	I experience tooth aches while chewing possibly due to habit of eating hard foods or clenching my teeth	29(9.0)	40(12.3)	136(42.0)	64(19.8)	55(17.0)	324(100.0)
6	I notice bleeding from my gum while brushing	21(6.5)	27(8.3)	109(33.6)	71(21.9)	95(29.3)	324(100.0)
7	I go for routine dental check-ups	33(10.2)	30(9.3)	134(41.4)	83(25.6)	44(13.6)	324(100.0)

Table 3.1. Level of practice

Level of Practice	Score Range (%)	n (%)
Good Practice	80–100	97 (29.90)
Fair Practice	60–79	143 (44.10)
Poor Practice	<60	84 (25.90)
Total	—	324 (100.00)

eight items, a total of 1,905(58.7%) positive responses, 127(3.9%) negative responses and 560(17.3%) uncertain responses were recorded, Table 2.

With total of eight attitude-related questions, each participant was able to score between 0 and 8. For each correct response, one point was awarded, while incorrect or "Don't know" responses received zero points. Based on the total scores, participants' attitude levels were categorized into three groups: positive attitude (80-100%), neutral attitude (60-79%), and negative attitude (<60%). Among 324 participants, two-third (66.7%) demonstrated a positive attitude towards oral health, about one-fourth (24.4%) fell into the neutral category, while only 8.9% had a negative attitude. The strongest agreement was observed for the belief that brushing twice daily improves oral hygiene (92.0%), followed by the view that maintaining healthy teeth benefits overall health (91.7%). In contrast, the lowest agreement was seen regarding the preventive role of fluoridated toothpaste in tooth decay (47.2%). Overall, the mean attitude score corresponded to a neutral level (73.5%), Table 2.1.

Oral health practices were evaluated through seven indicators, with response options ranging from "Always" to "Never." The results showed that most

participants (61.7%) regarded their teeth as equally important as other body parts, and more than half (52.8%) reported brushing twice daily. Nevertheless, a considerable proportion engaged in unfavorable practices, such as using their teeth to open bottles, which only 45.7% reported "never". Dental problems were also common, with 41.7% experiencing tooth sensitivity and 33.6% reporting bleeding gums occasionally. Routine dental visits were uncommon, as only 10.2% of participants reported attending check-ups consistently, Table 3.

For practice related questionnaire, each answer was assigned a specific score ranging from 1 to 5. The total score was calculated for each respondent by adding the points they scored. The total practice score ranged from 7 to 35, with higher scores indicating better oral health practices. Based on the total scores, participants' level of practice was categorized into three groups: good, fair and poor practice. Out of 324 participants, nearly one-third (29.9%) demonstrated good oral health practices, 44.1% exhibited fair practices, while about one-fourth (25.9%) had poor practices. Overall, these findings indicate that while a considerable number of participants maintain fair oral hygiene routines, there is still a substantial group whose practices are inadequate, highlighting the need for targeted interventions to improve daily oral health behaviors, Table 3.1.

Chi-square analysis based on Bloom's cut-off–derived categories revealed no statistically significant association between gender and knowledge level (χ^2=5.919, p=0.879). Similarly, no significant association was observed between gender and attitude level (χ^2=5.33, p=0.721) or between gender and practice level (χ^2=5.609, p=0.999), indicating that knowledge, attitude, and practice levels were comparable between male and female participants.

Pearson correlation analysis demonstrated a statistically significant positive correlation between total knowledge and practice scores (r=0.211, p<0.001), indicating that participants with higher knowledge levels tended to report better oral health practices. A significant positive correlation was also observed between total attitude and practice scores (r=0.268, p<0.001), suggesting that participants with more favourable attitudes toward oral health tended to report better oral health practices.

Discussion

This study assessed the oral health knowledge, attitude, and practices of patients attending a tertiary care facility and identified a clear discrepancy in awareness, perceptions and actual oral health behaviors. Although there were generally positive attitudes on oral health, the survey found significant knowledge gaps and inadequate application of good oral hygiene practices. There were more female participants than male participants. However, inferential analysis revealed no statistically significant association between gender and levels of knowledge, attitude, or practice. Similar findings have been reported in previous studies as well.[9]

The overall knowledge on oral health among participants was found to be moderate. People are now better informed in many fundamental areas because of the increased awareness of oral health raised by professionals and other forms of advertisement.[10] Similar to earlier research conducted in other regions of Nepal, a significant number of participants acknowledged the connections between tobacco use and oral cancer.[11,12] People are aware of dental infections, bacteria, gum disease, and decayed teeth.[13] These results imply that this group has a basic understanding of the negative consequences of dental disease and poor oral hygiene. However, there were significant gaps. Nearly half of the participants were aware of the necessity of replacing lost teeth, and even fewer were aware of dental plaque, suggesting knowledge was notably lower on areas with more technical or less obvious aspects of oral health, such as plaque accumulation, prosthetic replacement, etc. A research conducted in western Nepal, where there is a large demand for prostheses, can serve as an example of this.[14] In contrary, the study conducted in Hail city, Saudi Arabia, roughly 79% of respondents were aware that replacing lost teeth preserves both function and appearance.[15]

Participants in this study had an overall positive opinion regarding oral health. Similar to the study conducted in Nepal's Chitwan district, less than half of the respondents felt that fluoride toothpaste prevented dental decay, suggesting a generally unfavorable attitude toward its use.[16] In contrast to other developed nations where the value of fluoride is well recognized and prevention is more common[17], this could be due to a lack of awareness and encouragement regarding the positive effects of fluoride in our nation. In Beijing, China, 64% of schoolchildren, 73% of parents, and 74% of schoolteachers attested to the fact that fluoride toothpaste prevents dental caries.[18]

Despite moderate knowledge and positive attitude, oral health practices were suboptimal, highlighting a clear knowledge-practice gap. Only 10.2% of participants regularly went to the dentist for routine dental checkups, which is typical in low- and middle-income nations where dental appointments are frequently motivated by problems rather than prevention.[19] In a tertiary care setting, patients often seek dental services for pain relief or advanced disease management, which may reduce the

perceived importance of preventive behaviors such as regular check-ups and consistent oral hygiene practices. Several contextual barriers may further explain this gap. Factors such as treatment costs, long waiting times in tertiary hospitals, dental anxiety, time constraints, and competing personal or occupational responsibilities may discourage preventive care-seeking behavior, even among individuals who are aware of its benefits.[20] Additionally, patients may prioritize immediate symptom relief over long-term preventive gains, leading to delayed care and inconsistent oral health practices.

Importantly, the present study demonstrated significant positive correlations between knowledge and practice, and between attitude and practice, indicating that individuals with better knowledge and more favorable attitudes were more likely to engage in appropriate oral health behaviors. Similar associations have been reported in previous KAP studies, reinforcing the interconnected nature of knowledge, attitudes, and practices in oral health promotion.[21] However, the persistence of inadequate practices despite these associations suggests that external and structural barriers may hinder the translation of awareness into behavior.

Overall, these findings highlight the need for behavior-focused oral health promotion strategies that extend beyond information dissemination. Interventions should incorporate motivational counseling, address financial and structural barriers, and reinforce preventive behaviors within tertiary healthcare settings. Integrating oral health education into routine clinical encounters and strengthening referral pathways for preventive care may help bridge the gap between knowledge, attitude, and practice, ultimately reducing the burden of preventable oral diseases.

There are several limitations on the study. The use of convenience sampling from a single tertiary care dental clinic limits the generalizability of the findings beyond the specific study setting, and the results may not be representative of the wider community. The cross-sectional design prevents causal inference. Data were collected using a self-administered questionnaire, which is susceptible to social desirability bias. Participants may have over-reported favorable attitudes and good oral health practices, potentially leading to an overestimation of positive behaviors.

Conclusion

The result of this study demonstrated that participants had a modest level of knowledge of oral health, including its prevalent causes and the impact of lifestyle and dietary choices. Overall, participants exhibited favorable attitudes toward professional dental care and the importance of maintaining good oral hygiene. However, despite this awareness, many participants did not consistently engage in recommended oral health practices, such as regular dental check-ups and avoidance of unhealthy oral health behaviors.

No statistically significant differences in knowledge, attitude, or practice levels were observed between genders. Positive associations were identified between knowledge and practice, as well as between attitude and practice; however, the persistence of inadequate practices underscores a clear knowledge–practice gap, suggesting that factors beyond individual awareness may hinder the adoption of optimal oral health behaviors.

Acknowledgment

None

Conflict of Interest

None

Funding

None

Author's contribution

Concept, design, planning: MK, JG, ST, AM; Literature review: MK; Data collection: MK; Data analysis: JG; Draft manuscript: MK; Revision of draft: MK, JG, ST, AM; Final manuscript: MK, JG, ST, AM; Accountability of the work: MK, JG, ST, AM; Guarantor: MK

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