

Tobacco Use in Adolescents: Assessing Knowledge, Attitude, Behaviour and Oral Health Impact among School Children Aged 12-15 in Lucknow.

Abstract:

Background: Tobacco use among adolescents is an emerging public health concern. Early initiation may lead to addiction and adversely affect oral health. However, limited information exists regarding the knowledge, attitude, behaviour and oral health impact of tobacco use among schoolchildren in Lucknow, Uttar Pradesh.

Aim: To assess the knowledge, attitude, and behaviour related to tobacco use and its impact on oral health status among 12–15-year-old school-going children in Lucknow

Methods: A cross-sectional survey was conducted among 249 adolescents aged 12–15 years visiting the OPD of SPPGIDMS, Lucknow. A structured questionnaire was used to collect information regarding students' knowledge of tobacco-related health effects, attitudes toward tobacco use, and behaviour related to tobacco consumption. Oral health assessment was performed using the Community Periodontal Index (CPI) to evaluate periodontal status. The treatment needs component of the Community Periodontal Index of Treatment Needs (CPITN) was used to assess periodontal treatment requirements.

Results: No statistically significant differences were observed between boys and girls with respect to knowledge, attitude and behaviour related to tobacco use. Similarly, the distribution of CPITN scores showed no significant gender-based differences.

Conclusion: Gender did not influence tobacco-related knowledge, attitude, behaviour, or periodontal status among the participants. Despite high awareness, the presence of misconceptions and considerable periodontal treatment needs underscores the importance of comprehensive oral health education and preventive strategies targeting the entire population

Key-words: Tobacco; socioeconomic status; oral health status; CPITN; Adolescent.

Introduction:

Tobacco use is a leading preventable cause of death worldwide; the situation is more prevalent in developing countries. Use of tobacco among children and adolescents is already a pandemic.[1] Tobacco use is a grave concern globally and in India specifically, given the high prevalence rates across different age groups. The statistics from the Global Adult Tobacco Survey (GATS) and the Global Youth Tobacco Survey (GYTS) highlight the need for targeted interventions, as 28.6% of adults aged 15 years and 14.6% of children aged 13–15 years in India use tobacco in some form.[2]

Access this article online

Website:
www.ujds.in

DOI:
<https://doi.org/10.21276/ujds.2026.12.2.11>

¹MITUSMITA KALITA, ²GUNJAN YADAV,
³SONALI SAHA, ⁴SAUMYA NAVIT, ⁵SADAF KHAN,
⁶MANASH PRATIM BARUAH

¹⁻⁶Department of Pediatric and Preventive Dentistry, Sarder Patel Postgraduate Institute of Dental and Medical Sciences, Lucknow,

Address for Correspondence: Dr. Saumya Navit
Head of the Dept,
Department of Pediatric and Preventive Dentistry, Sarder Patel Postgraduate Institute of Dental and Medical Sciences, Lucknow, UP, India. Pincode- 226029
Email : saumyanavit@gmail.com

Received : 4 May, 2026, **Published :** 30 June, 2026

How to cite this article: Kalita, D. M., Yadav, G., Saha, S., Dr Saumya Navit, Khan, S., & Baruah, M. P. (2026). Tobacco Use in Adolescents: Assessing Knowledge, Attitude, Behaviour and Oral Health Impact among School Children Aged 12-15 in Lucknow. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 12(2).

Awareness about the risks of tobacco use was higher among school-going students. However, about three-fourths of the school-going students were unaware of health hazards and thought tobacco use was harmless.[3]

Adolescents trying tobacco products is a global issue that is causing serious health effects. A few types of smoking tobacco include cigarettes, beedis, hookah, chutta, while a few types of smokeless tobacco include gutkha, pan masala, mawa etc., marketed in the country in various forms, sizes and attractive packaging unreasonably with easy availability, cheaper costs, and injudicious publicity, under the least supervision.¹ The determinants of tobacco use among adolescents are associated with parental influence, school personnel, peer pressure, exposure to media advertisements and the sale of tobacco products near public places.[4]

Tobacco use causes many oral diseases and adverse oral conditions; a fact that is universally well-accepted. Consumption of tobacco is a significant acquired risk factor for periodontal disease. Smoking invariably has a destructive effect on the periodontium and in young people, smoking is a risk factor for aggressive, destructive periodontal disease.¹ Additionally, tobacco promotes plaque accumulation and calculus formation, facilitating disease progression. Structural changes in the periodontium include alveolar bone loss, widening of the periodontal ligament space, and delayed wound healing. The CPITN is primarily a screening procedure that requires clinical assessment for the presence or absence of periodontal pockets, calculus and gingival bleeding.

To the best of our knowledge, scanty literature is available on the awareness of tobacco use and its impact on oral health among adolescents in the Indian population. Hence, this present study aimed to ascertain the Knowledge, Attitude and Behaviour regarding tobacco use along with its impact on oral health status in 12-15-year-old school-going children in Lucknow, Uttar Pradesh.

MATERIALS AND METHODS:

Study Design and Setting :

This study was designed as a cross-sectional, questionnaire-based survey conducted among middle and high school children attending the outpatient department (OPD) of the Department of Pediatric and Preventive Dentistry at Sardar Patel Postgraduate Institute of Dental and Medical Sciences (SPPGIDMS) in Lucknow city, Uttar Pradesh, India, during the year 2025.

Ethical Approval and Permissions:

Prior to the commencement of the study, ethical clearance was obtained from the Institutional Ethical Committee of Sardar Patel Post Graduate Institute of Dental and Medical Sciences (PG/232454/IEC/SPPGIDMS) in line with the Declaration of Helsinki. Participants were provided with detailed information about the study and informed written consent was obtained from all participants. Confidentiality of responses and anonymity were assured throughout the study. The CTIRI registration number for the study is CTIRI/2026/04/109160.

Study Population and Sample Size :

A sample size of 249 children was considered adequate based on feasibility and comparable previous literature. Participants were recruited through convenience sampling from the OPD of the Department of Pediatric and Preventive Dentistry, SPPGIDMS, Lucknow, who consented to participate.

Inclusion Criteria :

1. Children between the age group of 12-15 years old.
2. Participants present at the time of the study and were eager to participate and gave informed consent.
3. Children who were residing in Lucknow.

Exclusion Criteria :

- (1) Children with a history of systemic disease like epilepsy etc.
- (2) Mentally or physically challenged children.
- (3) Children who were not willing to take part in the study.

Armamentarium:

S.No.	Instruments
1.	Mouthmirror
2.	CPITNprobe
3.	No. 23explorer
4.	Kidneytray
5.	Glovesandamouth mask

Detailed Methodology:

The study was done in 2 parts.

In the first part, data was collected using a pre-validated self-administered structured questionnaire. The sociodemographic domain consisted of name, age, gender, socioeconomic status (SES) and type of school of the children. A total of 10 questions using a

validated questionnaire were asked to assess the knowledge, attitude and behaviour related to tobacco use. Responses were taken in terms of yes or no.

The second part of the study consisted of an Oral Health assessment. The investigator carried out the examination with the use of a mouth mirror and a CPITN probe. The Community Periodontal Index (CPI) was used to assess the periodontal health status and Treatment needs part of the CPITN index was used to record the treatment needs. Scores of the CPITN index ranging from 0-4 was given and data was collected accordingly.[5]

CPITN SCORE	PERIODONTAL CONDITION CLINICALLY	TREATMENT NEEDS
0	Normally healthy periodontium	No treatment needed
1	Bleeding on probing	OHI
2	Presence of plaque and calculus	Scaling and polishing, OHI
3	Pocket depth is 4-5mm	Deep scaling with OHI
4	Pocket depth is more than 6mm	Scaling, root planning, surgical intervention

Statistical analysis:

Sample size estimation was done by using nMaster software (version 2, CMC, Vellore). Data was analysed using SPSS version 21. Categorical variables were presented as frequencies. Chi-square test and other suitable tests were used for inferential statistics.

Results:

Table 1: Socio-demographic profile

Socio-demographic profile			
		Frequency	Percent
Gender	Males	133	53.4%
	Females	116	46.6%
Age	12 years	22	8.8%
	13 years	23	9.2%
	14 years	72	28.9%
	15 years	132	53.0%
School	Govt	91	36.5%
	Pvt	158	63.5%
SES	Upper	53	21.3%
	Upper middle	105	42.2%
	Upper lower	81	32.5%
	Lower	10	4.0%

In Table 1, a total of 249 participants were included in the study, comprising 133 males (53.4%) and 116 females (46.6%). The majority of participants were aged 15 years (53.0%), followed by 14 years (28.9%), while smaller proportions were 13 years (9.2%) and 12 years (8.8%).

Most students were enrolled in private schools (63.5%), with the remaining 36.5% attending government schools. With respect to socioeconomic status, 42.2% of participants belonged to the upper middle class, followed by the upper lower class (32.5%), upper class (21.3%), and lower class (4.0%).

Table 2: Responses to different tobacco-related knowledge, attitude and behaviour questions

		Boys		Girls		pvalue
		Yes	No	Yes	No	
K1: Smoking is harmful to health	n	133	0	116	0	NA
	%	100.0%	0%	100.0%	0%	
K2: Sale of tobacco products to minors is prohibited in India	n	86	47	71	45	0.600, NS
	%	64.7%	35.3%	61.2%	38.8%	
K3: Consuming chewable tobacco cause Oral Cancer	n	133	0	116	0	NA
	%	100.0%	0%	100.0%	0%	
K4: Oral cancer can cause death	n	133	0	116	0	NA
	%	100.0%	0%	100.0%	0%	
K5: Smoke from another person is harmful	n	86	47	72	44	0.694, NS
	%	64.7%	35.3%	62.1%	37.9%	
K6: Do you think people who use tobacco have more friends?	n	80	53	74	42	0.602, NS
	%	60.2%	39.8%	63.8%	36.2%	
K7: Do you think smoking makes young people look cool?	n	47	86	44	72	0.694, NS
	%	35.3%	64.7%	37.9%	62.1%	
K8: Do you wish to consume guthka/ paan masala after you see any related advertisements?	n	47	86	44	72	0.694, NS
	%	35.3%	64.7%	37.9%	62.1%	
K9: Do you wish to smoke when you see any sportsman, film actors smoking?	n	47	86	44	72	0.694, NS
	%	35.3%	64.7%	37.9%	62.1%	
K10: Do you consider occasional tobacco use injurious to health?	n	86	47	72	44	0.694, NS
	%	64.7%	35.3%	62.1%	37.9%	

Graph 1: Responses to different tobacco-related knowledge, attitude and behaviour questions

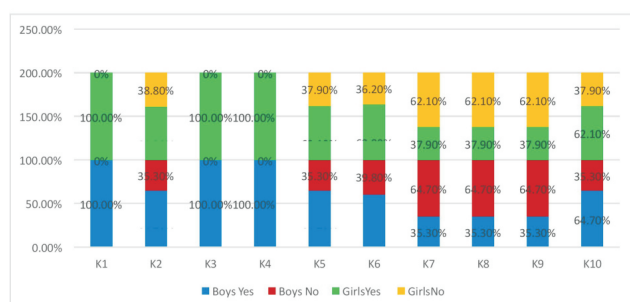


Table 2 and graph 1 showed that out of 249 participants, no statistically significant differences were found among boys and girls regarding different Knowledge, attitude and behaviour questions about tobacco use.

Table 3: CPITN SCORE

			CPITN SCORE			Total
			Score0	Score1	Score2	
Gender	Males	n	48	38	47	133
		%	36.1%	28.6%	35.3%	100.0%
	Females	n	43	28	45	116
		%	37.1%	24.1%	38.8%	100.0%
Total		n	91	66	92	249
		%	36.5%	26.5%	36.9%	100.0%
p value			0.713,NS			

Graph 2: CPITN SCORE

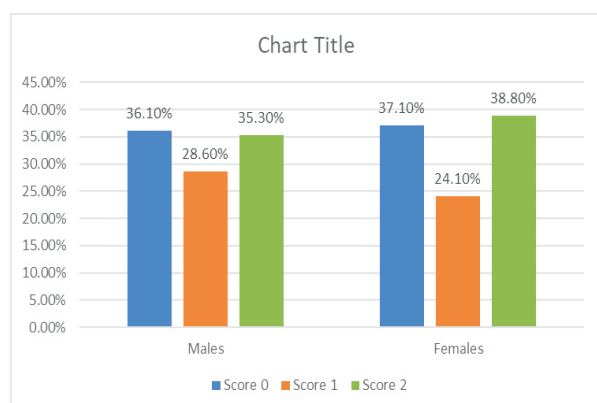


Table 3 and graph 2 showed the CPITN scores. The distribution of CPITN scores did not differ significantly between boys and girls.

Discussion:

This cross-sectional survey evaluated the oral health awareness regarding tobacco use of 249 children from the OPD of the Department of Pediatric and Preventive Dentistry, SPPGIDMS, Lucknow, Uttar Pradesh.

The age groups of **12-15 years** have been specified as the **global monitoring age for international comparisons and monitoring of disease trends by the WHO** (World Health Organization) to monitor the oral health status and also these age groups are especially important as a reliable sample may be obtained easily through the school system, and thus convenient to be surveyed. Hence, children from this age group were involved in our study.¹

Tobacco use is a major preventable cause of morbidity and mortality worldwide and represents a significant public health challenge, particularly in developing countries such as India. Despite this high prevalence, awareness regarding the harmful health effects of tobacco remains inadequate among many children. Initiation of tobacco use during adolescence is influenced by multiple determinants, including parental and peer behaviours, school environment, media exposure and easy accessibility of tobacco products.⁶

Tobacco consumption is a well-established risk factor for numerous oral diseases, especially periodontal disease, as it contributes to plaque accumulation, calculus formation, impaired immune response, delayed wound healing and progressive destruction of periodontal tissues. These changes manifest clinically as gingival inflammation, periodontal pocket formation, and alveolar bone loss, which can be effectively screened using the Community Periodontal Index of Treatment Needs (CPITN).⁷

The results of the present study inferred that no statistically significant differences were found among boys and girls in awareness of smoking harm, knowledge of restrictions on tobacco sales to minors, perceptions of social appeal and media influence and attitudes toward occasional tobacco use.

All participants (100%) correctly identified that smoking is harmful (K1), chewable tobacco causes oral cancer (K3) and oral cancer can lead to death (K4).

Awareness that the sale of tobacco to minors is prohibited (K2) was reported by 64.7% of boys and 61.2% of girls ($p = 0.600$). Knowledge regarding the harmful effects of second-hand smoke (K5) and occasional tobacco use (K10) was observed in 64.7% of boys and 62.1% of girls ($p = 0.694$).

Regarding perceptions, 60.2% of boys and 63.8% of girls believed tobacco users have more friends (K6) ($p = 0.602$), while 35.3% of boys and 37.9% of girls felt smoking makes young people look cool (K7) ($p = 0.694$). Similar proportions reported influence of advertisements (K8) and role models

(K9), with 35.3% of boys and 37.9% of girls expressing inclination toward tobacco use ($p = 0.694$).

The results of the present study were in accordance with the findings of the following authors, who also reported no or minimal gender differences in tobacco-related knowledge and attitudes among students.

Bhat *et al.* (2019)⁸ reported that schoolchildren of both genders had similar levels of knowledge regarding the harmful effects of smoking and smokeless tobacco, with no significant gender gap in core awareness items. **Verma *et al.* (2021)**⁹ observed that knowledge and attitude towards tobacco and its regulation did not differ significantly by gender, indicating uniform reach of tobacco control messages across boys and girls. **Kattimani *et al.* (2022)**² found high awareness about the hazards of tobacco and related legislation among adolescents, without significant gender-based differences in key knowledge and attitude domains.

In contrast, **Khubchandani *et al.* (2017)**¹⁰ reported that a substantial proportion of students believed that boys who smoke are more attractive or have more friends, and tobacco use prevalence was significantly higher among boys than girls, indicating gendered pro-tobacco norms not seen in the current study. Another study by **Chatterjee *et al.* (2016)**¹¹ found that male students were significantly more likely to report over-use of tobacco and supari than females, with clear gender differences in susceptibility and behaviour, contrasting with the lack of gender differences in the present results.

The results of the present study inferred that the distribution of CPITN scores did not differ significantly between boys and girls. The oral health status of the study population had no harmful impact.

Of the 249 participants included in the study, 133 were male and 116 were female. The distribution of CPITN scores among the study population showed that 36.5% of participants had a score of 0, 26.5% had a score of 1 and 36.9% had a score of 2.

Among males, 36.1% exhibited a CPITN score of 0, 28.6% had a score of 1, and 35.3% had a score of 2. In females, 37.1% had a score of 0, 24.1% had a score of 1, and 38.8% had a score of 2.

The present study demonstrated a nearly equal distribution of CPITN scores 0 (36.5%) and 2 (36.9%), indicating that while

a proportion of participants had a healthy periodontal status, a comparable proportion required professional intervention. Score 1 was observed in a relatively smaller segment (26.5%), reflecting moderate levels of gingival inflammation within the study population. This suggests a considerable burden of periodontal treatment needs.

Gender-wise comparison showed only minimal variation, with females exhibiting a slightly higher prevalence of CPITN score 2 and males a marginally higher proportion of score 1; however, these differences were not statistically significant ($p = 0.713$). This indicates that gender did not significantly influence periodontal status in the present study.

These findings were consistent with previous studies. **Liechti L *et al.* (2025)**¹² reported no significant association between gender and periodontal disease, supporting the present results. Similarly, **Albandar JM (2025)**¹³ highlighted that periodontal disease is more strongly associated with socioeconomic and behavioural factors than gender. A study by **Demirer S *et al.* (2012)**¹⁴ also emphasized the role of oral hygiene practices and lifestyle factors over gender in determining periodontal health.

The relatively higher proportion of individuals with a CPITN score of 2 in this study highlights the need for strengthened preventive and therapeutic strategies, including oral health education, early diagnosis and timely intervention.

Limitations:

- The study population taken into consideration in the study included only non-tobacco users.
- The study could have information bias, as students may be reluctant to reveal their tobacco use status.³
- Also, students could have reported socially desirable responses in the questionnaire.
- In India, there is a huge dropout rate after schooling so it is important that the survey must be extended to the youth who do not attend school or colleges.⁶

Conclusion and Recommendation:

In conclusion, although adolescents demonstrated a high level of awareness regarding the harmful effects of tobacco, misconceptions and behavioural susceptibility persist. A considerable proportion of participants exhibited periodontal treatment needs, indicating that awareness does not necessarily translate into optimal oral health outcomes. No statistically significant gender differences were observed in knowledge, attitude, behaviour, or periodontal status. These

findings highlight the need for comprehensive, school- and community-based preventive programs focusing on behavioural modification, early intervention, and oral health promotion. Further large-scale, population-based studies are recommended.

Reference

1. Singh SK, Wadhawan M, Varshney AM, Kumar A. Implementation Status of Tobacco-free Education Institutional Guidelines at Schools in Rural Areas of District Saharanpur, Uttar Pradesh. *J South Asian Assoc Pediatr Dent*. 2024;7(2):94–98.
2. Kattimani S, Thimmegowda U, Nagarathna C. Knowledge, Attitude and Behaviour Regarding the Hazards of Tobacco Use and Cigarette and Other Tobacco Products Act among Parents Visiting Pediatric Dental Clinic: A Cross-sectional Questionnaire Survey. *Int J Clin Pediatr Dent*. 2022;15(1):47–53.
3. Roy R, Kumar P, Pandey S, Ranjan A, Singh C. Tobacco Usage and Its Association with Mental Health Status of School-Going Adolescents Near Patna, Bihar: A Community-Based Cross-Sectional Study in Eastern India. *Cureus* 2023;15(5): e39033.
4. Kumar P, Shanmugam B, Jothikaran TAJ, Ezhumalai S. Perception of Tobacco Use among School-Going Early Adolescent Children in Udupi District: A Cross-sectional Study. *J Psychiatry Spectr*. 2023;2(2):80-87.
5. Al-Hassan S, Kazlak M, Kateeb E. Effectiveness of an Interactive School-Based Oral Health Educational Program on Periodontal Status Among Palestinian Adolescents: An Intervention Study. *Children (Basel)*. 2025 Sep;12(10):1302.
6. Tiwari RV, Megalamanegowdru J, Gupta A, Agrawal A, Parakh A, Pagaria S *et al*. Knowledge, Attitude and Practice of Tobacco Use and Its Impact on Oral Health Status of 12 and 15 Year-Old School Children of Chhattisgarh, India. *Asian Pac J Cancer Prev*. 2014;15(23):10129-10135.
7. Janeswar A, Kumar G, Kanungo S, Singh A, Subramanya GB, Jha K. Prevalence patterns and profile of adolescent tobacco users findings from a youth survey: A cross-sectional study. *J Family Med Prim Care*. 2019;8:2017-22.
8. Bhat PK, Sushma SG, Jayachandra MY. Knowledge and attitude about tobacco use among school personnel in Bangalore South - a cross-sectional study. *RJDS*. 2019;11(1):14–20.
9. Verma A, Goswami M, Dhillon JK. Tobacco use among school-going children. *Indian J Dent Res*. 2021;30(6):839–843.
10. Khubchandani J, Macias Y. Knowledge, attitudes, and perceptions about tobacco among middle and high school students in India. *Asian Pac J Cancer Prev*. 2017;18(2):439–446.
11. Chatterjee N, Bhattacharjee D. Tobacco use among adolescents in India: a study of risk factors and gender differences. *J Family Med Prim Care*. 2016;5(4):788–792.
12. Liechti L, Regitz-Zagrosek V, Gebert P, Schmidlin PR, Campus G. Sex and gender differences in periodontal disease: a cross-sectional study in Switzerland. *BMC Oral Health*. 2025 Aug 13;25(1):1324.
13. Al-Hassan SI, Kazlak MM, Kateeb E. Prevalence and socio-behavioural determinants of periodontal disease among adolescents in the northern West bank: a cross-sectional study. *BMC Oral Health*. 2025 Oct 24;25(1):1666.
14. Demire S, Gursoy UK, Ozdemir H, Erdemir EO, Uitto VJ. Periodontal health knowledge and smoking are associated with periodontal treatment need according to tooth brushing levels. *West Indian Med J*. 2012 Mar;61(2):191-7.