

# Tobacco Turmoil in Teens and Preparedness of Pediatric Dentists: A Global Survey

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## ABSTRACT

**Background:** Tobacco use amongst adolescents causes significant health problems affecting almost all organs and has a significant effect on normal growth and development. Smoker adolescents are also more prone to oral health problems than nonsmokers. Pediatric dentists can play a significant role in providing tobacco cessation counseling to adolescents.

**Aim:** To assess the knowledge (K), perceptions (PR), training, and practices (PE) of pediatric dentists related to the provision of tobacco cessation interventions.

**Materials and methods:** A cross-sectional online survey with convenience sampling was planned to assess the K, PR, training, and PE of pediatric dentists across the globe in dealing with tobacco menace amongst adolescents. The survey was done through a self-administered questionnaire in the form of an online Google Form. The study population consisted of pediatric dentists attending the International Academy of Pediatric Dentistry (IAPD) virtual conference 2021.

**Results:** A total of 1,564 participants were targeted and 235 answered the survey with a response rate of 15.02%. Attending tobacco cessation intervention ( $p \leq 0.001$ ) and training in postgraduation on tobacco cessation ( $p \leq 0.002$ ) showed significant association with favorable practice scores. However, in the PR domain age in years ( $p \leq 0.043$ ), country of residence (continent,  $p \leq 0.001$ ) was found to be significantly associated with attending tobacco cessation intervention ( $p < 0.001$ ) and training in postgraduation ( $p < 0.001$ ).

**Conclusion:** The results of the study emphasize the need for recommendations for educating pediatric dentists by the inclusion of tobacco cessation interventions in the core curriculum, continuing dental education programs, and promoting professional responsibility to help achieve tobacco-free youth all across the globe.

**Keywords:** Adolescents, Cessation, Dentists, Intervention, Pediatric, Smoking, Tobacco.

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## INTRODUCTION

Children are most vulnerable to the direct and indirect effects of tobacco. Tobacco affects almost all organs leading to considerable morbidity and mortality all across the globe. Teenage years usually mark the start of tobacco use, with the most rapid increase occurring at the age of 14–15 years, and the years between 10 and 13 seem to be quite a vulnerable period to initiate smoking.<sup>1</sup> A report from the Centers for Disease Control and Prevention mentioned that nearly 9 out of 10 adults who smoke cigarettes daily first tried smoking by the age of 18.<sup>1</sup> According to the data from World Health Organization (Global health observatory), the prevalence of tobacco use amongst adolescents (13–15 years) was found to be 19.33%, comprising of 23.29% male and 15.35% female smoker adolescents in 133 countries. The highest prevalence in male (24.76%) and female (19.4%) adolescents was found in high-income countries (22.08%), whereas low-income countries had the lowest prevalence (14.95%).<sup>2</sup> Exposure to smoke during early years has been found to be associated with an increased risk of delayed lung development, asthma, pneumonia, bronchitis, tuberculosis, neurobehavioral impairment, recurrent middle ear infections, cardiovascular diseases, and leukemia.<sup>3,4</sup> Smoking habits in adolescence can set a platform for other kinds of drug abuse later in life.<sup>5,6</sup> A case-control study has also found high rates of cigarette smoking in adolescents being associated with bipolar disorder.<sup>7</sup>

Smoker adolescents are also known to have a greater predilection toward oral health problems such as gingivitis (72.8%), gingival bleeding (51.2%), oral malodor, or halitosis (39.6%). Tobacco use amongst adolescents has been found to be strongly associated with oral mucosal changes, precancerous lesions,

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such as leukoplakia, erythroplakia, hairy tongue, smoking-related melanosis, hyperkeratosis, and oral cancer.<sup>3,8</sup> Healthcare providers at all levels are being involved in making tobacco control a priority and everyone's responsibility to tackle this epidemic. It

is irrefutable that not only preventing the use of tobacco brings health benefits, but postponing its early use also aids in gaining healthy development.<sup>9</sup> Adolescents, being a vulnerable group, are targeted by tobacco companies by offering them fancy initiatives like flavored products, herbal alternatives, attractive colorful packaging, and smokeless cigarettes. Dentistry has a large skill base and many subspecialties; pediatric dentists, amongst them, form an important group of clinicians as they come across the young population and can play a major role in prevention. Dentists usually get to meet patients over multiple visits, along with regular checkups every 6 months. This can be taken up as an opportunity to engage dental patients in conversations while they are in their practice to help identify, start the intervention and provide the follow-up care. Pediatric dentists, thus, are in a strategic position whereby they can play a significant role as cessation specialists in adolescents by favoring to assist and reinforce the concept of tobacco cessation and empowering adolescent patients to quit smoking. It must be given precedence in pediatric dental care to ensure tobacco control in the young population. Countries across the globe have adopted different health plans for handling the tobacco menace at the local levels depending upon the population needs and resources available and few have successful tobacco cessation plans established.<sup>10,11</sup>

Various studies have been done on dentists assessing their K, attitude, and PE in providing tobacco cessation services in their areas. Lack of confidence in conducting the counseling due to inadequate information on tobacco cessation in the core curriculum, lack of special training to assist quitting, nonavailability of resource material and shortage of time to spend on tobacco cessation counseling, exclusive pedodontics practice, addressing smoking may cause offense to their patients are the reasons quoted by dental practitioners for not taking tobacco cessation as a priority during a dental appointment in various studies conducted.<sup>9–14</sup> The perusal of dental literature divulges the fact that there is no data available on the preparedness of pediatric dentists to provide tobacco cessation support and treatment in adolescents. The tobacco epidemic is a global epidemic, a baseline data is therefore required to assess the involvement of pediatric dentists around the world in tobacco cessation programs. Hence, a global survey was planned to check the preparedness and PE of pediatric dentists around the world to tackle the tobacco menace among adolescents.

## Aim

To assess the knowledge, perceptions, training, and practices of pediatric dentists related to the provision of tobacco cessation interventions.

## MATERIALS AND METHODS

A cross-sectional online survey with convenience sampling was planned to assess the K, PR, training, and PE of pediatric dentists across the globe in dealing with tobacco menace among adolescents. Institutional Ethical Clearance was taken for the study. The survey was done through a self-administered questionnaire in the form of an online google form. The study population consisted of pediatric dentists attending the IAPD virtual conference 2021. The participant's data was obtained from the conference app and the survey link was sent to participants *via* messages through the conference app. The questionnaire was opened on 8<sup>th</sup> June 2021, two reminders were sent on the 2<sup>nd</sup> and 5<sup>th</sup> day of the conference and was closed on 17<sup>th</sup> June 2021 at midnight. Participation in the study was totally voluntary and participation was taken as consent.

## Questionnaire Design (Annexure 1)

The self-administered questionnaire consisted of 22 questions and two parts. The first part focused on the demographics that included socioprofessional information regarding gender (male and female), age (21–30, 31–40, 41–50, 51–60, and above 61 years), country of residence (categorized into continents Asia, Europe, North America, South America, Africa, and Australia), type of practice (public and private). The questionnaire also enquired whether participants were into exclusive pedodontics practice or academics, had been trained in tobacco cessation counseling, or had received any training related to tobacco during their postgraduation (yes or no response). The rest of the questions were further grouped into K, PR, and PE domains.

The K domain evaluated their knowledge regarding tobacco screening tools used in adolescents, “yes” was taken as the correct response and assigned a score of 1 and the selection of at least one specific screening tool used for adolescents from the options was given a score of 1. The PE domain consisted of six questions, namely tracking tobacco status (yes/no), 5As, telling harmful effects of tobacco (yes/no), involving parents (yes/no), setting quit date (yes/no), and referral (yes/no). The “yes” response was taken as favorable practice and assigned a score of 1 and “no” response score of 0. Any of the 5As responses ticked was assigned a score of 1. The PR domain consisted of four questions— preparedness to counsel pediatric patients (“very well prepared” to “not at all prepared,” 4-point Likert scale), simply telling can help to quit (yes/no), repeated counseling sessions can help in quitting (yes/no), and training should be given to pediatric dentists (yes/no). For yes and no responses, “yes” was taken as a favorable perception response and given a score of 1 while “no” was given a score 0. “Very well” to “adequately prepared” to counsel pediatric patients were taken as favorable perception and given a score of 1. Mean scores were calculated for all three domains. The score range for the K domain was 0–2, with a mean score (K score) of 0.485. Similarly, for the PR and PE domain, it was 0–4, with the mean PR score being 3.14 and 0–6 with the mean PE score being 3.9. A pilot study was done to check for feasibility, comprehensiveness, and time taken to complete the survey. It was done on 10 pediatric dentists who were not part of the study. Appropriate amendments were done to the questionnaire. The corrections were also done according to the comments from the subject experts. The Cronbach's  $\alpha$  value was 0.70.

## Statistical Analysis

The data collected was fed to Statistical Package for the Social Sciences version 21.0 (IBM, Chicago, United States of America) for statistical analysis. The data consisted of both qualitative and quantitative variables. The distribution of the data was checked using the Kolmogorov–Smirnov test. The distribution was found to be skewed. Hence, nonparametric tests were used. Descriptive statistics, association, correlation, and logistic regression analysis were done using suitable tests. Statistical significance was set at  $p < 0.05$ .

## RESULTS

Out of a total of 1,564 participants targeted, 235 answered the survey with a response rate of 15.02%. Table 1 describes the sociodemographic distribution of the study participants. Out of a total of 235 participants who responded, 17.4% were males and 82.6% were females. The respondents were further categorized into different age groups according to years. The

**Table 1:** Sociodemographic data of study participants

Variables	N (%)	K score* p-value	PE score * p-value	PR SCORE* p-value
Gender <sup>a</sup>				
Male (M)	41 (17.4)	0.510	0.327	0.267
Female (F)	194 (82.6)			
Age in years <sup>b</sup>				
21–30	64 (27.2)	0.572	0.501	0.043
31–40	78 (33.2)			
41–50	49 (21.0)			
51–60	35 (14.8)			
61 above	9 (3.8)			
Place <sup>b</sup>				
Asia	102 (43.4)	0.116	0.350	0.001
Europe	56 (23.8)			
North America	26 (11.1)			
South America	29 (12.3)			
Africa	18 (7.6)			
Australia	4 (1.8)			
Type of practice <sup>b</sup>				
Private	133 (56.6)	0.697	0.319	0.689
Public	102 (43.4)			
Exclusive pedo practice <sup>a</sup>				
Yes	177 (75.3)	0.140	0.016	0.946
No	58 (24.7)			
Academician <sup>a</sup>				
Yes	142 (60.5)	0.426	0.180	0.746
No	93 (39.5)			
Tobacco cessation program <sup>a</sup>				
Yes	58 (24.7)	0.016	<0.001	<0.001
No	177 (75.3)			
Training in tobacco during postgraduation <sup>a</sup>				
Yes	44 (18.9)	0.003	0.002	<0.001
No	191 (81.1)			

\* $p \leq 0.05$  was taken as statistically significant; a, Mann–Whitney  $U$  test; b, Kruskal–Wallis test

majority of respondents fell in the age group of 31–40 (33.2%) followed by 21–30 (27.2%), 41–50 (21%), 51–60 (14.8%), and 61 years plus (3.8%).

Respondents from 48 countries covering six continents participated in the survey and the majority of them belonged to Asia (43.4%), followed by Europe (23.8%), and the Americas (23.4%). Practice distribution revealed 56.6% of the respondents working in a private setup, whereas 43.4% were in the public sector. Around 75.3% of respondents were found to be into exclusive pedodontic practice. 60.4% of the professionals were into academics/teaching. Only 18.9% of the respondents received training related to tobacco-related issues during postgraduation, while 24.7% attended conferences/workshops regarding tobacco cessation interventions.

Deciphering the PR of the respondents, 32.3% were not at all prepared to counsel pediatric patients regarding tobacco-related issues, while 67.7% felt adequately to very well prepared. Around 11.4% of respondents felt that even simply telling the patient to quit can make a difference, whereas 89.7% responded that only repeated counseling sessions could help the patients to quit smoking. And 91.4% of the respondents felt the need for specialized training for pediatric dentists in tobacco-related cessation interventions in adolescents.

Evaluating the PE of participants, 38.7% responded in affirmation of identifying and tracking the tobacco status of children visiting

their practice. Around 85.4% applied the strategy of 5A's in helping patients quit. 83.5% of participants responded that if identified, they advise the patient about the harmful effects of tobacco, and 67.1% preferred involving parents or guardians in helping the patient quit. 42.6% responded in the affirmative that they help patients in setting quit dates and further discussed strategies for quitting. 61.8% referred patients to cessation centers as well.

Regarding the knowledge component of the respondents, 22.9% perceived that they were aware of tobacco screening tools which can be used as a quick screen in adolescents and 24.8% of respondents were able to identify at least one tobacco screening instrument used for adolescents. Nearly 60.4% of the respondents helped the patients in quitting tobacco achieving a 0–15% success rate.

### Knowledge, Perceptions, and Practices

Mann–Whitney  $U$  test and Kruskal–Wallis test were used to determine the association between different sociodemographic variables and mean K, PE, and PR scores. Table 1 shows the respective  $p$ -values calculated in three domains with different variables. A statistically significant association was found between mean K scores and attending tobacco cessation intervention programs ( $p \leq 0.016$ ). A similar significant association ( $p \leq 0.003$ ) was found between mean K scores and training received in tobacco cessation during postgraduation. Those in exclusive pediatric

practice exhibited a significant association with favorable PE scores ( $p \leq 0.016$ ). Again, attending tobacco cessation intervention ( $p \leq 0.001$ ) and training in postgraduation on tobacco cessation ( $p \leq 0.002$ ) showed significant association with favorable PE scores. However, in the PR domain, age in years ( $p \leq 0.043$ ) and country of residence (continent,  $p \leq 0.001$ ) were found to be significantly associated with attending tobacco cessation intervention ( $p < 0.001$ ), and training in postgraduation ( $p < 0.001$ ). When further, regression was done for age and continent in the PR domain; it was found that in the 21–30 years age group, Asia, followed by Europe, had significantly favorable perception scores.

Positive Spearman's correlation coefficient (Table 2) was calculated between mean K scores and mean PE scores with a value of 0.365 (statistically significant at  $p \leq 0.001$ ), mean K scores and mean PR scores with a value of 0.139 (statistically significant at  $p \leq 0.05$ ), and mean PE scores and mean PR scores with value 0.265 (statistically significant at  $p \leq 0.01$ ).

Logistic regression analysis was done for statistically significant variables in PR and PE domains (Tables 3 and 4). It was observed that when the effect of three significant variables in the PE domain was examined together, attending any tobacco cessation intervention

training workshop had a significant ( $p \leq 0.03$ ) impact on favorable practice scores. Similarly, when statistically significant variables, namely age, continent, attending tobacco cessation interventions, and training in postgraduation for PR domain, were subjected to logistic regression analysis, training in postgraduation ( $p \leq 0.01$ ) came out with a significant impact on favorable PR score.

## DISCUSSION

Due to the globalization of the tobacco epidemic having cross-border effects, the national and local policies should take a cue from international legislations and policies to help generate a global response to the tobacco menace. To eradicate it across borders, preventing and intervening the tobacco use in young should be made an integral part of tobacco cessation campaigns.<sup>15</sup>

Healthcare systems with pediatric settings must include a screen for any kind of tobacco exposure for every child seen. Due to professional fragmentation, the provision of preventive counseling and messages is deemed to be the responsibility of hygienists, whereas a dentist's major domain remains treatment. Since a

**Table 2:** Correlation between mean K, PE, and PR scores

			K score	PE score	PR score
Spearman's $\rho$	K score	Correlation coefficient	1.000	0.365**	0.139*
		Significant (two-tailed)	0.00	0.000	0.033
	PE score	Correlation coefficient	0.365**	1.000	0.265**
		Significant (two-tailed)	0.000	0.00	0.000
	PR score	Correlation coefficient	0.139*	0.265**	1.000
		Significant (two-tailed)	0.033	0.00	0.000

\*\*Correlation is significant at the 0.01 level (two-tailed); \*correlation is significant at the 0.05 level (two-tailed)

**Table 3:** Logistic regression analysis for statistically significant variables in PE domain

Variables	B	Standard error	Wald	Degree of freedom	Significance	Odds ratio	95% confidence of interval for the odds ratio	
							Lower	Upper
Do you provide dental treatment exclusively to pedo patients?	0.398	0.317	1.579	1	0.209	1.490	0.800	2.773
Have you attended any program on tobacco cessation interventions?	1.020	0.388	6.903	1	0.003*	2.774	1.296	5.939
Were you in any capacity trained in tobacco cessation interventions during PG?	0.651	0.429	2.296	1	0.130	1.917	0.826	4.447
Constant	-0.140	0.280	0.251	1	0.616	0.869	---	---

\*p-value significant at  $\leq 0.05$

**Table 4:** Logistic regression analysis for statistically significant variables in the PR domain

Variables	B	Standard error	Wald	Degree of freedom	Significance	Odds ratio	95% confidence of interval for odds ratio	
							Lower	Upper
Age	0.016	0.126	0.015	1	0.901	1.016	0.794	1.300
Continent	-0.103	0.109	0.899	1	0.343	0.902	0.728	1.117
Have you attended any program on tobacco cessation interventions?	0.499	0.358	1.950	1	0.163	1.648	0.817	3.322
Were you in any capacity trained in tobacco cessation interventions during PG?	1.000	0.391	6.562	1	0.010*	2.719	1.265	5.847
Constant	-1.389	0.546	6.461	1	0.011	0.249	---	--

\*p-value significant at  $\leq 0.05$

short and clear message from a medical professional has a greater impact and tobacco cessation and prevention is an important service, this challenge for a specialized healthcare professional should be taken up as a priority and should also motivate the staff to understand the importance of screening such patients. Each member of the team should play their role at the individual level and through collaborations for preventing and controlling tobacco use. Pediatric dentists receive special training in child psychology and behavior management and can use their skills to ask, advise, assist, and arrange for interventions and coach them through as a team. There is a scarcity of studies assessing the PR, K, and PE of dentists in tobacco cessation PE. Lack of proper training during various dentistry programs in the core curriculum made them feel less confident in carrying out the right conversation at the right moment in the previous studies.

To the best of our knowledge, no study has been done to assess the preparedness of pediatric dentists' tobacco cessation intervention and control in the adolescent population. The present study was able to shed light on the preparedness of pediatric dentists around the world in tobacco cessation intervention and control.

A small percentage of respondents received training during their postgraduation or attended any program for tobacco cessation interventions. The respondents' knowledge for tobacco cessation counseling seemed to be poor. The knowledge gained during postgraduation led to favorable perception scores, whereas training in tobacco cessation workshops had a significant impact on practice scores. This points toward conducting more workshops/training programs with a basic training module in the core curriculum. A positive attitude and willingness to take up tobacco cessation counseling was observed amongst pediatric dentists, as 91.2% of the respondents felt the need for specialized training for tobacco cessation interventions. Amongst the demographic variables, age had a significant impact on perceptions toward tobacco cessation. The younger age group (21–30 years) had more favorable PR. An increase in the high-impact antitobacco mass media campaigns, comprehensive smoke-free policies, ban implementation, and enforcement during the past few years coinciding with their graduate and postgraduate teaching must have led to more awareness and enthusiasm amongst the young respondents.

Amongst the continents, Asia, followed by Europe was found to have favorable perception scores. Logistic regression for mean K, PR and PE score showed that participants with high K scores had favorable tobacco cessation PE and PR. Also, those who had favorable PR toward tobacco cessation followed favorable PE at their workplaces. The study further reflected that despite poor K scores, pediatric dentists had favorable perception scores and tried to translate that into practice.

The results of the study emphasize the need for recommendations for educating pediatric dentists on tobacco cessation in the adolescent population. Epidemiology of tobacco use, strategies for smoking interventions, and the associated pathological conditions are required to be made an integral part of the dental curriculum. The use of 5A's and 5R's models should be made an essential component of their clinical practice. Collaborations should be sought if required to help control the tobacco epidemic and to improve the quality of life.

Pediatric dentists, along with pediatricians and tobacco cessation centers, together can all make a difference in reducing and finally eliminate the growing tobacco turmoil in adolescents. It would also help provide direct benefits to the patient's health and improve overall oral and treatment outcomes when identified.

The tobacco epidemic is a global epidemic, and there is an urgent need to establish a network of specialized comprehensive tobacco-dependence treatment services that meet international standards of care.

With the limitations of a cross-sectional questionnaire-based study, a low response rate, and uneven participation from different continents, the results cannot be generalized over a larger population set. A low response can also suggest a low knowledge regarding tobacco cessation or low interest in incorporating such interventions in their preceptions. Still, the study does provide insight into the willingness and preparedness of pediatric dentists who participated in the survey. By promoting professional responsibility, provision of tobacco cessation interventions training during the postgraduate programs and continuing education programs on tobacco cessation counselling, pediatric dentists can be motivated and majorly contribute toward tobacco cessation and prevention in adolescents.

## ANNEXURE I

### Questionnaire

Q1 Name (optional)

Q2 Age

Q3 Country of residence

Q4 Gender:

(A) Male

(B) Female

(C) Others

Q5 Type of practice

(A) Private

(B) Public

Q6 Do you provide treatment exclusively to pediatric patients?

(A) Yes

(B) No

Q7 Are you an academician as well?

(A) Yes

(B) No

Q8 Have you attended any program on tobacco cessation interventions?

(A) Yes

(B) No

Q9 Were you in any capacity trained to manage tobacco-related issues in children during your postgraduation?

(A) Yes

(B) No

### Perceptions, Practices, and Knowledge

Q10. How prepared do you feel to counsel the pediatric patients about tobacco-related issues?

(A) Very well-prepared

(B) Well-prepared

(C) Adequately prepared

(D) Not at all prepared

Q11. Do you think only by simply telling a patient to quit smoking is going to make a difference?

(A) Yes

(B) No

(C) Maybe

Q12. Do you think repeated counseling sessions are a must to help the patient quit tobacco?

(A) Yes

(B) No

Q13. Do you think pediatric dentists should receive special training in tobacco cessation interventions in adolescents?

- (A) Yes  
(B) No

Q14. Do you identify and track the tobacco status of adolescents visiting your practice?

- (A) Yes  
(B) No

Q15. Which of the following amongst the 5A's recommended for tobacco cessation do you use in your office (tick all that is applicable)?

- (A) Ask  
(B) Advise  
(C) Assess  
(D) Assist  
(E) Arrange

Q16. Do you know any tobacco screening tool which can be used for screening tobacco and substance use in adolescents?

- (A) Yes  
(B) No

Q17. Which of the following instruments can be used as a quick screen for tobacco in the pediatric patient samples (tick all that is applicable)

(A) Car, Relax, Alone, Forget, Friends, Trouble recommended by the AAPD

(B) Brief Screening for Tobacco, Alcohol and other drugs developed by the National Institute on Alcohol Abuse and Alcoholism, United States of America

(C) Problem-oriented screening instrument for teenagers  
(D) Modified version of the Fagerstrom tolerance questionnaire (mFTQ)

- (E) Drug Abuse Screen Test 20  
(F) Cigarette smoking initiation risk assessment tool  
(G) Can't say

Q18. If identified, do you advise the patient about the harmful effects of tobacco?

- (A) Yes  
(B) No

Q19. Do you involve parents /guardians in helping the patient quit?

- (A) Yes  
(B) No

Q20. Do you help set up a quit date and discuss various strategies to quit?

- (A) Yes  
(B) No

Q21. Do you refer patients to cessation clinics or tobacco cessation programs or collaborate with clinicians on tobacco control issues, if required

- (A) Yes  
(B) No

Q22. What is your perceived percentage of success rate in helping patients to quit?

- (A) 0–15%  
(B) 15–40%  
(C) 40–60%

- (D) 60–80%  
(E) >80%

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