

# Urban and rural disparity in tobacco use and knowledge about oral cancer among adolescents: An epidemiological survey on 12 and 15-year school going students

Rajesh Sabnis, Kamtaram Sahu, Deepak Thakur, Sanidhya Surana, Heena Mazhar, Soumy Pandey

Department of Oral and Maxillofacial Surgery, Rungta College of Dental Sciences and Research, Bhilai, Chhattisgarh, India

Corresponding author (email: <dr.ramtiwarirjn@gmail.com>)

Dr. Heena Mazhar, Department of Oral and Maxillofacial Surgery, Rungta College of Dental Sciences and Research, Bhilai, Chhattisgarh, India.

Received: 30-03-16

Accepted: 08-12-16

Published: 30-12-16

## Abstract

**Aims and Objectives:** To assess and compare the tobacco use prevalence; to understand and compare attitudes and knowledge related to tobacco use and its health impact among urban and rural students; and to assess urban and rural disparity in the use of tobacco among 12 and 15-year-old adolescents in the urban and rural schools in Chhattisgarh, India. **Materials and Methods:** A cross-sectional study was conducted among 12 and 15-year-old urban and rural school going children in Durg District. Scientifically, based on the data obtained from the pilot study, sample size was calculated. A total of 1000 children were selected to be a part of the study and were interviewed face-to-face using a detailed pretested, close-ended questionnaire. The Statistical Package for the Social Sciences version 16.0 (SPSS Pvt. Ltd, Chicago, IL, USA) was used for the statistical analyses. **Results:** Prevalence of tobacco consumption was 48.8%. Males were involved predominantly in consuming tobacco. The knowledge and attitude was better in the school children of urban areas than the school children of rural areas; more of the urban school children were involved in smoking cigarette. Rural children outnumbered urban children in the smokeless tobacco consumption. **Conclusion:** Prevalence of tobacco consumption among school children remains high with a wide disparity among urban and rural children. There is an urgent need to have a rural orientation in the National Tobacco Control Program that is currently being developed by the Government of India and giving relevance to the youth.

**Key words:** Adolescence, adolescent, oral cancer, tobacco cessation, tobacco control

## INTRODUCTION

With the advent of the 21<sup>st</sup> century, India has become one of the countries that is most affected by tobacco-related mortality.<sup>[1]</sup> A strange irony is that tobacco still exists as an easy, accessible, and legally available addictive substance and is a major contributor

to mortality and morbidity, as well as a high contributor for chronic diseases and almost all kinds of cancers found in humans.<sup>[2]</sup> Approximately 1 in 10 in the age group 13-15 year has consumed tobacco, and out of these almost half reported initiation before 10 years

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

**How to cite this article:** Sabnis R, Sahu K, Thakur D, Surana S, Mazhar H, Pandey S. Urban and rural disparity in tobacco use and knowledge about oral cancer among adolescents: An epidemiological survey on 12 and 15-year school going students. J Int Soc Prevent Communit Dent 2016;6:S226-31.

Access this article online	
Quick Response Code:	Website: www.jispcd.org
	DOI: 10.4103/2231-0762.197200

of age.<sup>[3]</sup> Initiation of tobacco use is rooted midst the adolescence, with above 80% of adult smokers starting to smoke before attaining the age of 18 years; additionally, adolescents consuming smokeless tobacco are expected to grow into adult cigarette smokers than do the nonusers.<sup>[1,4]</sup> India ranks second in the production and the third in consumption of tobacco, and the prevalence is still rising, posing serious threat to public health.<sup>[5]</sup>

In contempt of the reinforced laws and regulations as per the COTPA-2003, there are children who are continuously exposed to the tobacco menace.<sup>[6]</sup> Various studies have been conducted about tobacco consumption among adolescents,<sup>[1,3]</sup> however, the literature appears to be very less with regard to comparison of tobacco usage among 12 and 15-year-old adolescents in the urban and rural schools in India.<sup>[7]</sup> Therefore, this study had the following aims (1) Assessing and comparing the prevalence of tobacco use; (2) comparing knowledge and attitudes related to tobacco use and its health impact among urban and rural students; (3) disparity in tobacco use in urban and rural areas among 12 and 15-year-old adolescents in the urban and rural schools in Chhattisgarh, India.

## MATERIALS AND METHODS

### Source of data and study population

The target population consisted of all 12–15-year-old school going children in Durg district. The Durg district consists of two Municipal Corporations (urban area) and 70 Gram Panchayats (rural area).

### Sample size determination and sampling procedure

A total of 50 school children participated in the pilot study, which was carried out among 15-year-old school children from a private school of Durg Municipal Corporation (Urban area) to determine the feasibility of the study.

The sample size was determined by fixing the probability of committing type I error ( $\alpha$ ) at 5% and that of type II error ( $\beta$ ) at 20%, thus maintaining the power of the study at 80%. The sample size was calculated using the Cochran formula, which yielded a sample size of 508.

The same number (500) participants were selected from both the urban and rural areas, making the sample size to be 1000.

### Ethical approval

Before the commencement of this study, the synopsis was presented before the institutional ethical committee of Rungta College of Dental Sciences and Research, Bilai. Important suggestions were then included in the present study as per the instructions of the members.

### Informed consent

Both verbal and written informed consent was obtained from the participants and parents of the participants before their participation in the research. The parents who refused to give consent, their child/ward was abstained from the research.

### Data collection

#### Scheduling

The examinations were carried out on all the weekdays excluding the second Saturdays, Sundays, and holidays. The entire survey period spanned over a period of 4 months from November 2015 to February 2016.

#### Questionnaire

A pretested, close-ended questionnaire was prepared for the interview keeping in mind the level of understanding of the children. The questionnaire was prepared covering the sociodemographic details, knowledge, and attitude toward tobacco usage and its health impact.

For the construction of questionnaire a panel of experts was selected who were trained in researches pertaining to tobacco and its oral impact and who were well versed in both English and Hindi languages. The questionnaire constructed was then sent to a peer expert committee for checking its content and face validity. After which necessary corrections and modifications were done and was made ready to use in the research.

Personal interviewing method was employed which used a pretested series of questions.

### Statistical analysis

For the statistical analysis of the data, the Statistical Package for the Social Sciences version 16.0 (SPSS Pvt. Ltd, Chicago, IL, USA) was employed. Frequency distribution and Chi-square tests at 95% confidence interval were also calculated for analyzing the results. *P* value less than 0.05 was considered to be statistically significant.

## RESULTS

### Baseline characters [Table 1]

Table 1 depicts the baseline and demographic characteristics of the sample population. The total sample size constituted of 1000 school going children of 12 and 15-year age group. The male-to-female ratio was approximately 1:1.

### Prevalence of tobacco use [Table 2]

The prevalence of tobacco consumption was found to be 48.8% ( $n = 488$ ). According to the age group [Figure 1], in the sample population, majority of the 15-year-old school children (61.20%) were involved in consuming tobacco when compared to the 12-year-old (39.32%); the difference was found to be statistically significant. When assessed for the prevalence according to the sex [Figure 1], the males were indulged predominantly in consumption of tobacco (62.84%) than the girls (34.51%); the difference was found to be statistically significant.

The tobacco consumption was done in mainly two forms, i.e., either smoked or smokeless; 29.4% ( $n = 294$ ) were indulged in smoking, 28.3% ( $n = 283$ ) in using smokeless or chewable forms, and 8.9% ( $n = 89$ ) were consuming both the forms of tobacco. The irony was that in consumption of any of the abovementioned forms of tobacco males were significantly involved in outrageous numbers the girls [Figure 2].

### Knowledge and attitudes related to tobacco use and its health impact: Urban v/s rural [Table 3]

Smoking is harmful to health was agreed by a majority of the students. Sale of tobacco products to minors is prohibited in India; this fact was assessed by a question and urban students had more knowledge in this regard. A total of 83.2% of urban students responded that

tobacco chewing can cause oral cancer. The fatality and mortality which could be caused due to oral cancer was known to 53.6% of urban students and 33.4% of rural students. The harmful effect of passive smoking was also assessed, and it was seen that 66% of the urban students and 46% of rural students agreed to this fact.

For the question, do you think people who use tobacco have more friends?, 18.6% of the rural students responded “yes.” An inclination towards smoking was

Table 1: Baseline characteristics		
N=1000		
Variables	Frequency	Percentage (%)
Gender		
Male	506	50.6
Female	494	49.4
Age group		
12 Years	567	56.7
Boys	299	52.73
Girls	268	47.27
15 Years	433	43.3
Boys	207	47.80
Girls	226	52.20
School Location	Students	
Rural Area	500	50.00
Age		
12 Years	292	58.4
15 Years	208	41.6
Sex		
Boys	288	57.6
Girls	212	42.4
Urban Area	500	50.00
Age		
12 Years	275	55
15 Years	225	45
Sex		
Boys	218	43.6
Girls	282	56.4

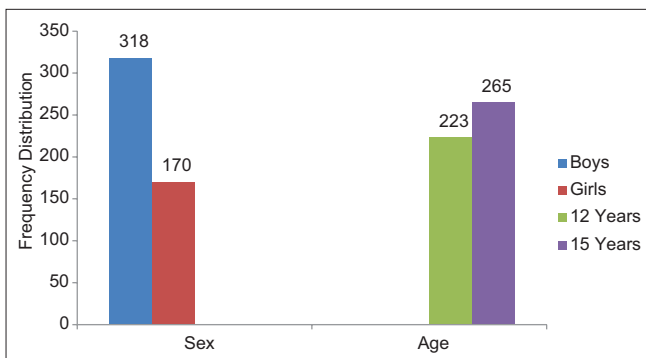


Figure 1: Tobacco consumption according to sex and age

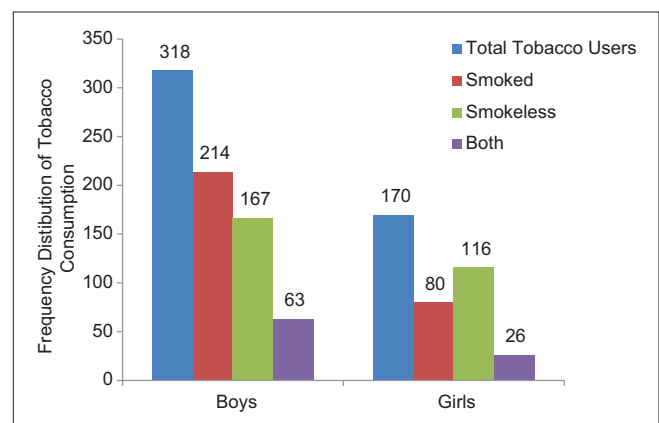


Figure 2: Tobacco consumption among boys and girls

**Table 2: Tobacco consumption prevalence and behavior**

N=1000	Frequency	Percentage (%)	Chi-square test P
Number of children consuming tobacco	488	48.8	
Tobacco use according to sex			
Boys	318	62.84	<0.001*
Girls	170	34.41	
Tobacco use according to age			
12 Years	223	39.32	<0.001*
15 Years	265	61.20	
Tobacco use form			
Smoked form	294	29.4	
Boys	214	72.78	<0.001*
Girls	80	27.21	
Smokeless form	283	28.3	
Boys	167	59.00	<0.001*
Girls	116	41.00	
Both	89	8.9	
Boys	63	70.78	<0.001*
Girls	26	29.21	
Smoked form	294	29.4	
Cigarette	151	51.36	0.56
Bidi	143	48.64	
Smokeless form	283	28.3	
Quid with Tobacco	67	23.68	<0.05*
Paan Masala	62	21.90	
Guthka	154	54.42	

Chi-square test; \*( $P \leq 0.05$ , Statistically significant, CI=95%), N=Number of study participants

**Table 3: Descriptive statistics for knowledge and attitudes related to tobacco use and its health impact**

Questions	Rural students		Urban students	
	Yes (%)	No (%)	Yes (%)	No (%)
Smoking is harmful to health	920 (92%)	80 (8%)	960 (96%)	40 (4%)
Sale of tobacco products to minors is prohibited in India	308 (30.8%)	692 (69.2%)	638 (63.8%)	362 (36.2%)
Consuming chewable tobacco cause Oral Cancer	630 (63%)	37 (37%)	832 (83.2%)	168 (16.8%)
Oral cancer can cause death	334 (33.4%)	666 (66.6%)	536 (53.6%)	464 (46.4%)
Smoke from other person is harmful	460 (46%)	540 (54%)	660 (66%)	340 (34%)
Do you think people who use tobacco have more friends?	186 (18.6%)	814 (81.4%)	88 (8.8%)	912 (91.2%)
Do you think smoking makes young people look cool?	102 (10.2%)	898 (89.8%)	415 (41.5%)	585 (58.5%)
Do you wish to consume guthka/pan masala after you see any related advertisements?	706 (70.6%)	294 (29.4%)	70 (7%)	930 (93%)
Do you wish to smoke when you see any sportsman, film actor smoking?	104 (10.4%)	896 (89.6%)	792 (79.2%)	202 (20.2%)
Do you consider occasional tobacco use injurious to health?	350 (35%)	650 (65%)	670 (67%)	330 (33%)

seen in urban students. A total of 70.6% of the rural students responded “yes” while only 7% of the urban students agreed that they wish to consume guthka/pan masala after seeing any related advertisements. A total of 79.2% of the urban students responded affirmatively whereas 89.6% rural students rejected that they wish to smoke after seeing any sportsman or film actor smoking. A myth that occasional use of tobacco is harmful was judged by asking a question, to which shockingly 65% of the rural students said “no.” The overall knowledge and attitude was better in the urban school children than the rural school children.

### Urban v/s rural disparity in tobacco use [Table 4]

There was a highly statistically significant difference between the urban and rural school children in consumption of tobacco. Out of the 318 boys consuming tobacco, 219 were from the rural schools and 99 from the urban schools; further, out of the 170 girls who indulged in tobacco use 114 were from rural schools and 56 from urban schools [Figure 3], the difference was found to be highly statistically significant. For the smoked form, more of the urban school children ( $n = 89$ ) were involved in smoking

cigarette than do the rural school children ( $n = 62$ ); the difference was statistically significant. However, when compared with smoking bidi, 142 rural school children were indulged in contrast to only 1 urban school child; the difference was highly statistically significant. There was a highly statistically significant difference in the consumption of smokeless form of tobacco among the urban and rural school children [Figure 4].

### DISCUSSION

There are various reports regarding tobacco consumption from different parts of India, i.e., 1.9% in

New Delhi to 75% in Mizoram;<sup>[8]</sup> the total prevalence of tobacco consumption in the present study was found to be 48.8% [Table 1], this finding is significantly higher than the reports of Global Youth Tobacco Survey (GYTS) 2009 (14.6%),<sup>[3]</sup> 2006 (13.7%),<sup>[1]</sup> and 2003 (16.9%).<sup>[9]</sup> Boys (62.84%) were predominantly involved in consumption of tobacco than girls (34.41%); similar findings were reported by Patna and Gupta,<sup>[10]</sup> as 57% boys and 41% of the girls were current tobacco users; however, the rates were significantly more when compared to the reports of GYTS 2009:<sup>[3]</sup> boys (19.0%) and girls (8.3%).

29.4% ( $n = 294$ ) of the school going children were indulged in using smoked tobacco; this finding is considerably higher than the GYTS 2006 and GYTS 2009.<sup>[3]</sup> The smokeless or chewed form of tobacco was consumed by 28.3% children, which is much more than that reported by GYTS 2006 and 2009<sup>[3]</sup> and Jayakumary *et al.*<sup>[11]</sup> There was a statistically significant association between gender and smokeless tobacco use ( $P < 0.001$ ) [Table 2], which may be attributed to the easy and cheap availability of the smokeless tobacco products in the markets.<sup>[12]</sup> The findings are corroborated by the other Indian studies.<sup>[13-15]</sup> The increase in consumption of these smokeless tobacco products is due to injudicious publicity and availability.<sup>[16]</sup>

The fact that tobacco is a risk factor for oral cancer was known to 83.2% urban students in contrast to 63% of the rural students. The fact that oral cancer can be fatal was agreed only by 53.6% of the urban and 33.4% of the rural school children; these findings are corroborated by the reports of Mukherjee *et al.*<sup>[17]</sup> and Mangalath *et al.*<sup>[18]</sup>

A total of 155 urban school children in contrast to 333 rural school children consumed tobacco, and the difference was found to be statistically

**Table 4: Urban and rural disparity in tobacco use**

Basic characteristics	Tobacco use		Chi-square test P
	Urban school children	Rural school children	
Number of children consuming tobacco $n=488$	155	333	<0.001*
Tobacco use according to sex			
Boys	99	219	<0.001*
Girls	56	114	<0.001*
Tobacco use according to age			
12 Years	43	180	<0.001*
15 Years	112	153	<0.007*
Form of tobacco use			
Smoked form	90	204	<0.001*
Cigarette	89	62	<0.017*
Bidi	1	142	<0.001*
Smokeless form	81	202	<0.001*
Quid with Tobacco	34	33	0.899
Paan masala	8	54	<0.001*
Guthka	39	115	<0.001*

Chi square test; \*( $P \leq 0.05$ , Statistically significant, CI=95%), N=Number of study participants

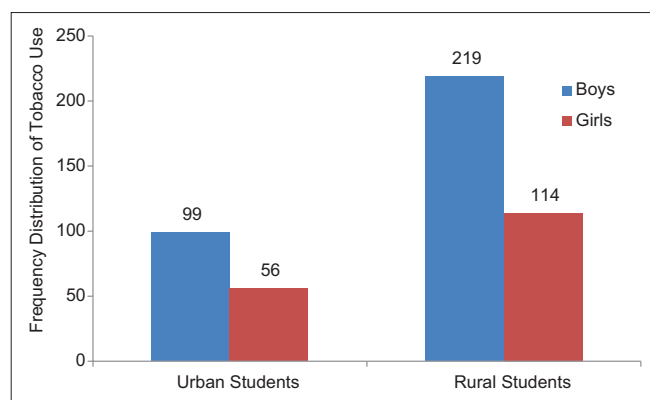


Figure 3: Tobacco use according to sex

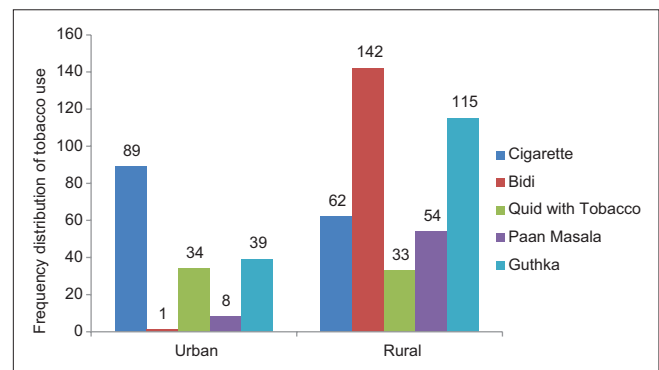


Figure 4: Urban v/s rural discrepancy in forms of tobacco use

significant ( $P < 0.001$ ) [Table 4]. This finding matches with that of the report by Stevens *et al.*<sup>[19]</sup>

More rural school children were involved in tobacco consumption than urban school children; this finding matches with the reports of Stevens *et al.*<sup>[19]</sup> Significant difference ( $P < 0.001$ ) exists among smokers in the rural and urban school children, with the former outnumbering the latter by large numbers findings and matching with the reports of Harrell *et al.*<sup>[20]</sup> The rural school children essentially and largely indulged in smokeless tobacco consumption than the urban children, and this disparity was also found to be statistically significant ( $P < 0.001$ ) [Table 4]; this finding is similar to the reports of Stevens *et al.*<sup>[19]</sup> and Shah and El Haddad.<sup>[21]</sup>

The imbedded underlying recommendations which can be extracted are:

Requirement of child-based tobacco cessation counseling and health education, implementing COTPA stringently, and protection of the future of the country from the evil of Tobacco. There are limitations in the present study just like any population-based survey such as of social desirability associated with responding to a questionnaire, which can be managed by the use of a qualitative open-ended instrument.

Humans have used tobacco in many forms for several centuries.<sup>[22]</sup> There is a clear cut difference in tobacco use prevalence in school going children among those living in rural versus urban areas. A higher use of tobacco in rural adolescents will gradually lead to a higher number of people with health problems, which the rural areas are ill equipped to handle. Because tobacco use is one of the preventable causes of morbidity and mortality, efforts should be made to control tobacco use among the adolescents.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Sagarkar AR, Sagarkar RM, Arabbi KC, Shivamallappa SM. A substantive review on tobacco use among school-going adolescents in India. *J Int Soc Prev Community Dent* 2013;3:7-11.
- Bhawna G. Burden of Smoked and Smokeless Tobacco Consumption in India-Results from the Global adult Tobacco Survey India (GATS-India)-2009-2010. *Asian Pac J Cancer Prev* 2013;14:3323-9.
- Narain R, Sardana S, Gupta S, Sehgal A. Age at initiation and prevalence of tobacco use among school children in Noida, India: A cross-sectional questionnaire based survey. *Indian J Med Res* 2011;133:300-7.
- Centers for Disease Control and Prevention (CDC). Tobacco use among middle and high school students- United States, 2000–2009. *MMWR Morb Mortal Wkly Rep* 2010;59:1063-8.
- Naik S, Khanagar S, Kumar A, Ramachandra S, Vadavadagi SV, Dhananjaya KM. Assessment of effectiveness of smoking cessation intervention among male prisoners in India: A randomized controlled trial. *J Int Soc Prev Community Dent* 2014;4(Suppl 2):S110-5.
- Prabhu P, Srinivas R, Vishwanathan K, Raavi A. Factors influencing alcohol and tobacco addiction among patients attending a de-addiction Centre, South India. *J Int Soc Prev Community Dent* 2014;4:103-7.
- World Health Organization. Basic oral health surveys. 5<sup>th</sup> ed. 1997. p. 35-55.
- Narayan DD, Dhondibarao GR, Ghanshyam KC. Prevalence of Tobacco Consumption among the Adolescents of the Tribal Areas in Maharashtra. *J Clin Diagn Res* 2011;5:1060-3.
- Bhojani UM1, Elias MA, Devadasan N. Adolescents' perceptions about smokers in Karnataka, India. *BMC Public Health* 2011;11:563.
- Patna, Gupta PC (2002). Youth tobacco Surveillance in Northeastern States of India, 2001; Proceeding of Tobacco Research in India: Supporting efforts to reduce harm.
- Muttappallymyalil J, Divakaran B, Thomas T, Sreedharan J, Haran JC, Thanzeel M. Prevalence of Tobacco Use Among Adolescents in India. *Asian Pac J Cancer Prev* 2012;13:5371-4.
- 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;15:10129-35.
- Reddy UK, Siyo RK, Haque MA, Basavaraja H, Acharya BL, Divakar DD. Effectiveness of health education and behavioral intervention for tobacco de-addiction among degree students: A clinical trial. *J Int Soc Prev Community Dent* 2015;5(Suppl 2):S93-100.
- Mishra S, Mishra MB. Tobacco: Its historical, cultural, oral, and periodontal health association. *J Int Soc Prev Community Dent* 2013;3:12-8.
- Raina R, Krishna M, Murali R, Shamala A, Yalamalli M, Kumar AV. Knowledge, attitude and behavioral determinants of tobacco use among 13-15 year old school children. *J Int Soc Prev Community Dent* 2015;5:321-6.
- Sushma C, Sharang C. Pan masala advertisements are surrogate for tobacco products. *Indian J Cancer* 2005;42:94-8.
- Mukherjee A, Sinha A, Taraphdar P, Basu G, Chakrabarty D. Tobacco Abuse among School Going Adolescents in a Rural Area of West Bengal, India. *Indian J Public Health* 2012;56:286-9.
- Mangalath U, Aslam SA, Abdul Khadar AH, Francis PG, Mikacha MS, Kalathingal JH. Recent trends in prevention of oral cancer. *J Int Soc Prev Community Dent* 2014;4(Suppl 3):S131-8.
- Stacey Stevens, Brian Colwell, and Linnae Hutchinson. Tobacco Use in Rural Areas: A Literature Review. *Rural Healthy People 2010*. Texas A and M University System Health Science Center.
- Harrell JS, Bangdiwala SI, Deng S. Smoking Initiation in Youth: The role of Gender, Race, Socioeconomics, and Developmental Status. *J Adolesc Health* 1998;23:271-9.
- Shah AH, El Haddad SA. Oral hygiene behavior, smoking, and perceived oral health problems among university students. *J Int Soc Prev Community Dent* 2015;5:327-33.
- Al-Maweri SA, Al-Jamaei AA, Al-Sufyani GA, Tarakji B, Shugaa-Addin B. Oral mucosal lesions in elderly dental patients in Sana'a, Yemen. *J Int Soc Prev Community Dent* 2015;5(Suppl 1):S12-9.