

# Assessment of Oral Hygiene Knowledge, Attitude, and Practices among Medical Students in a Medical College in the State of Telangana: A Cross-sectional Survey

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## ABSTRACT

**Context:** This is a knowledge, attitude, and practices model of analyzing the knowledge of oral hygiene aids, performance, and measures among medical students. **Aim:** The aim of the present study is to assess the knowledge, attitude, and practice of oral hygiene among medical students aged 17–35 years. **Materials and Methods:** 500 medical students of various grades were included in the study. Pre-tested structured closed-ended questionnaire was given to each student in their classrooms. All the questions regarding oral hygiene were filled by the students in 15-min duration. **Results:** 95.4% of subjects agree that oral health is important for general health. 69.4% of the participant's brush their teeth once daily, 28.4% of them brush twice daily, and 64.0% of the participants prefer combined type of motion. 49.0% individuals change their toothbrush once in 2–3 months. 92.2% of subjects change their brushes in 2–3 months. **Conclusion:** The knowledge regarding oral hygiene was satisfactory except knowledge about dental floss. Visiting a dentist is still not considered a preventive dental behavior.

**Key words:** Attitude, knowledge, medical students, oral hygiene, self-reported questionnaire


## INTRODUCTION

Oral health is a vital component of the general health of an individual that influences on one's general quality of life and well-being.<sup>[1]</sup> According to the World Oral Health report 2003, the prevalence of periodontitis is 86% in India. Oral health has been neglected for long in India.<sup>[2]</sup> Enhanced oral health can be achieved with increased awareness and better practices.<sup>[1]</sup>

A knowledge, attitude, and practices (KAP) survey is a quantitative method (pre-defined questions formatted in standardized

questionnaires) that provides access to quantitative and qualitative information. KAP survey essentially records an “opinion” and is based on the “declarative” (i.e., statements). The survey reveals what was said, but there may be considerable gaps between what is said and what is done.<sup>[3]</sup>

KAP study tells us what people know about certain things, how they feel, and also how they behave. The knowledge possessed by a community refers to their understanding of any given topic oral hygiene in this case. Attitude is an acquired characteristic of an individual. People demonstrate a wide variety of attitudes toward dental care and dentists.<sup>[3]</sup> These attitudes naturally reflect their own experiences, cultural perceptions, familial beliefs, and other life situations, and they strongly influence the health status of the oral cavity.<sup>[1]</sup> Practice refers to the ways in which they demonstrate their knowledge and attitude through their actions.<sup>[3]</sup>

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Keeping a healthy oral profile requires joint efforts from the dentist as well as the patient himself. One of the most important factors that decide the dental health of a population is the outlook of its people toward their dentition.<sup>[4]</sup> Students play a vital role in health promotion and preventive information dissemination among their family and their society, and therefore, their oral health attitude and practices conform to the expectations of the population. The booming young medical students are not exposed to health-care knowledge as dental professionals.<sup>[1]</sup> Understanding the levels of KAP will enable a more efficient process of awareness creation as it will allow the program to be tailored more appropriately to the needs of the community. Hence, the present study was aimed to assess the KAP of oral hygiene among medical students aged 17–35 years.

## METHODS

### Ethical Clearance

An observational, descriptive, cross-sectional survey study was conducted at Kamineni Institute of Medical Sciences, Nalgonda. This proposed study was reviewed by the Institutional Ethical Committee, and their clearance was obtained. A total of 500 students were selected using a convenience sampling technique. A informed consent was obtained from each patient.

### Study Sample and Sampling Technique

A cross-sectional study using a 20-item structured was conducted to assess oral hygiene KAP in a sample of medical students ( $n = 500$ ) [Graph 1].

All the semester students who were present on the day of survey were included in the study. Permission to conduct this study was obtained from the concerned authorities of the college, who in turn, through a circular, notified students about the intent of the study. Pilot study was conducted on 50 students for pre-testing of the questionnaire and to determine feasibility of the study.

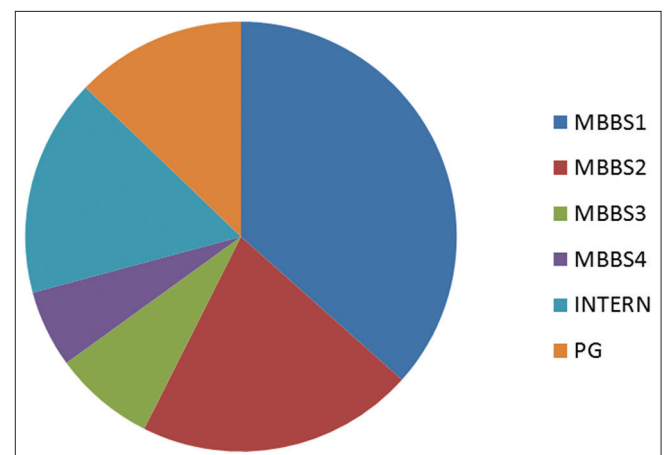
### Questionnaire

The study involved self-administration of pre-tested structured closed-ended questionnaire, to each student in their classrooms. Questionnaire consisted of 20 multiple choice questions to evaluate knowledge (5 questions) and attitude (5 questions); students received a full explanation on how to fill in the questionnaire. Students were asked to fill in the questionnaire without discussing with each other, and

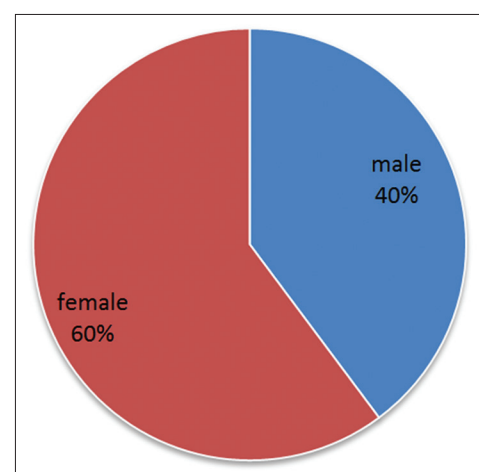
an average time of 15 min was taken to complete the procedure. It was made sure that none of the questions were left un-attempted. Anonymity of the respondents was assured. The students were then provided with health education regarding oral hygiene practices. The study was completed within a period of 2 weeks.

### Statistical Analysis

The data collected were compiled using Microsoft Office Excel and was subjected to statistical analysis using the statistical software package, Statistical Package for the Social Sciences version 19.0 for MS Windows, and  $P < 0.05$  was considered statistically significant. Frequency distribution, number, and percentage were calculated. The descriptive statistics and statistical significance of any difference between the two genders were determined using Chi-square test.



Graph 1: Total number of participants



Graph 2: Gender distribution of participants

## RESULTS

The present study was carried out on 500 students. Among them, 40% were males and 60% were females [Graph 2].

Table 1 reveals that 96.6% of the participants agree that there are two sets of dentition in human beings, only 1% of the participants did not know about it, and 2.4% disagree with it. 91.8% of the participants had knowledge about the number of permanent teeth in an adult's mouth, whereas the remaining 8.2% of the participants did not have correct knowledge. 38.2% of the participants had knowledge about dental deposits, whereas 22.8% did not know about it and the rest of the participants, i.e., 39% assume it to be the food particles or stains. The difference between males and females regarding knowledge of dental deposits was statistically significant ( $P = 0.004$ ), and females

had better knowledge regarding it. 72.6% of the participants had knowledge about interdental aids, whereas 27.4% of the students had no knowledge regarding it. The difference between males and females regarding knowledge about interdental aids was statistically significant ( $P = 0.003$ ), and females had better knowledge regarding it. 75.4% of students knew that bleeding gums are related to our general health conditions, whereas 21.6% of the students disagree with that and 3% of them had no knowledge about it. The difference between males and females regarding the knowledge about bleeding gums corresponding to the general health condition was statistically significant ( $P = 0.038$ ), and males had better knowledge regarding it.

Table 2 shows that most of the study population (95.4%) think that oral health is important for overall health, whereas the remaining 4.6% do not think

**Table 1:** Comparison of gender related to knowledge of oral hygiene

Items	Male (%)	Female (%)	Total (%)	Chi-square	P value
There are two sets of dentition in human beings, baby teeth set, and permanent teeth set, and permanent teeth set				0.882	0.643
Agree	191 (96)	292 (97)	483 (96.6)		
Disagree	5 (2.5)	7 (2.3)	12 (2.4)		
Do not know	3 (1.5)	2 (0.7)	5 (1.0)		
How many permanent teeth are there in adults mouth				3.661	0.300
20	5 (2.5)	3 (1.0)	8 (1.6)		
28	14 (7.0)	13 (4.3)	27 (5.4)		
30	2 (1.0)	4 (1.3)	6 (1.2)		
32	178 (89.4)	281 (93.4)	459 (91.8)		
If there is a yellow or brownish yellow discoloration near tooth/gum, what is it				13.484	0.004*
Food particles	28 (14.1)	38 (12.6)	66 (13.2)		
Calculus/tartar	59 (29.6)	132 (43.9)	191 (38.2)		
Stains	66 (33.2)	63 (20.9)	129 (25.8)		
Do not know	46 (23.1)	68 (22.6)	114 (22.8)		
Do you know there are some aids to clean the spaces between teeth, which are named as interdental aids?				11.787	0.003*
Yes	129 (64.8)	234 (77.7)	363 (72.6)		
No	70 (35.2)	67 (22.3)	137 (27.4)		
Is bleeding gums related to our general health condition				8.430	0.038*
Agree	162 (81.4)	215 (71.4)	377 (75.4)		
Disagree	30 (15.1)	78 (25.9)	108 (21.6)		
Do not know	7 (3.5)	8 (2.7)	15 (3.0)		

\* $P < 0.05$  statistically significant

**Table 2:** Comparison of gender related to the attitude of oral hygiene

Items	Male (%)	Female (%)	Total (%)	Chi-square	P value
Do you think, oral health is important for overall health ?				1.661	0.436
Yes	189 (95.0)	288 (95.7)	477 (95.4)		
No	10 (5.0)	13 (4.3)	23 (4.6)		
How often should you visit the dentist ?				3.374	0.497
Only in problem	112 (56.3)	172 (57.1)	284 (56.8)		
Once in 3 months	19 (9.5)	24 (8.0)	43 (8.6)		
Once in 6 months	26 (13.0)	49 (16.3)	75 (15.0)		
Never	42 (21.1)	56 (18.6)	98 (19.6)		
Reason for visiting the dentist?				7.577	0.181
Extraction	2 (1.0)	8 (2.7)	10 (2.0)		
As a routine visit	53 (26.6)	95 (31.6)	148 (29.6)		
Filling	20 (10.1)	24 (8.0)	44 (8.8)		
Scaling	27 (13.6)	27 (9.0)	54 (10.8)		
Replacement of teeth	10 (5.0)	8 (2.7)	18 (3.6)		
Others	87 (43.7)	139 (46.2)	226 (45.2)		
Reason for not having routine dental visit?				23.422	0.001*
Lack of time	64 (32.2)	70 (23.3)	134 (26.8)		
Lack of access	12 (6.0)	4 (1.3)	16 (3.2)		
Expensive	8 (4.0)	20 (6.6)	28 (5.6)		
Lack of knowledge and motivation	4 (2.0)	25 (8.3)	29 (5.8)		
I never had a problem	94 (47.2)	163 (54.2)	257 (51.4)		
Others	17 (8.5)	19 (6.3)	36 (7.2)		
Which one do you prefer to clean your teeth?				8.241	0.083
Toothbrush and toothpaste	191 (96.0)	293 (97.3)	484 (96.8)		
Toothbrush and powder	3 (1.5)	7 (2.3)	10 (2.0)		
Others	5 (2.5)	1 (0.3)	6 (1.2)		

\*P&lt;0.05 statistically significant

that it is important. 56.8% of the participants visit the dentist only in problem, whereas 19.6% of them never visited the dentist. Of the study population, 10.8% prefer scaling as the reason for visiting the dentist, 29.6% said as a routine visit, and 45.2% said for other reasons such as bleeding gums and orthodontic treatment... According to 51.4% of the study population, they never had a problem, it is the main reason for not having routine dental visits, 5.6% of the participants think that dental treatment is expensive, and 26.8% of the students could not visit the dentist due to lack of time. The difference between males and females regarding the reason for not having routine dental visits is statistically significant ( $P < 0.05$ ). 96.8% of the participants had a good attitude of using toothbrush and toothpaste

to clean the teeth, and 2% of the individuals prefer toothbrush and toothpowder.

Table 3 reveals that 69.4% of the participants brush their teeth once daily, 28.4% of them brush twice daily, and 1.6% of the individuals brush occasionally. The difference between males and females regarding the frequency of toothbrushing was statistically significant ( $P = 0.032$ ). 64.0% of the participants prefer the combined type of motion; 7.6% of the individuals use vertical motion; 9.4% of the individuals prefer horizontal motion; and 19.0% of the individuals prefer circular motion while brushing. 48.8% of the population had a practice of using medium bristled toothbrush; 37.2% used soft-bristled toothbrush, whereas only 4.4% used hard-bristled toothbrush and 9.6% of the individuals never

**Table 3:** Continued

Items	Male (%)	Female (%)	Total (%)	Chi-square	P value
How often do you brush your teeth?				8.821	0.032*
Once a day	133 (66.8)	214 (71.1)	347 (69.4)		
Twice a day	57 (28.6)	85 (28.2)	142 (28.4)		
More than twice a day	2 (1.0)	1 (0.3)	3 (0.6)		
Occasionally	7 (3.5)	1 (0.3)	8 (1.6)		
What type of motion do you use while brushing?				1.239	0.744
Vertical	17 (8.5)	21 (7.0)	38 (7.6)		
Horizontal	17 (8.5)	30 (10.0)	47 (9.4)		
Combined	124 (62.3)	196 (65.1)	320 (64.0)		
Circular	41 (20.6)	54 (17.9)	95 (19.0)		
What type of brush do you use?				4.520	0.210
Hard	11 (5.5)	11 (3.7)	22 (4.4)		
Medium	106 (53.3)	138 (45.8)	244 (48.8)		
Soft	65 (32.7)	121 (40.2)	186 (37.2)		
Never noticed	17 (8.5)	31 (10.3)	48 (9.6)		
How often you change your toothbrush?				14.368	0.002*
Monthly	63 (31.7)	91 (30.2)	154 (30.8)		
2–3 months	105 (52.8)	140 (46.5)	245 (49.0)		
4–5 months	14 (7.0)	55 (18.3)	69 (13.8)		
When bristles flare	17 (8.5)	15 (5.0)	32 (6.4)		
Do you clean your tongue?				2.328	0.127
Yes	179 (89.9)	282 (93.7)	461 (92.2)		
No	20 (10.1)	19 (6.3)	39 (7.8)		
Do you rinse your mouth after eating?				0.953	0.329
Yes	165 (82.9)	239 (79.4)	404 (80.8)		
No	34 (17.1)	62 (20.6)	96 (19.2)		
Do you use a mouthwash?				6.101	0.047*
Yes	78 (39.2)	91 (30.2)	169 (33.8)		
No	121 (60.8)	210 (69.8)	331 (66.2)		
Have you ever noticed smell from your mouth?				3.991	0.262
Yes	90 (45.2)	106 (35.2)	196 (39.2)		
No	109 (54.8)	195 (64.8)	304 (60.8)		
Apart from brushing, what other methods do you use to clean your teeth?				4.235	0.237
Dental floss	25 (12.6)	40 (13.3)	65 (13.0)		
Interdental brushes	10 (5.0)	16 (5.3)	26 (5.2)		
Tooth pricks	74 (37.2)	86 (28.6)	160 (32.0)		
None	90 (45.2)	159 (52.8)	249 (49.8)		
Have you ever noticed bleeding in your gums?				5.710	0.127
Yes	56 (28.1)	82 (27.2)	138 (27.6)		
No	143 (71.9)	219 (72.75)	362 (72.4)		
If yes, what method you prefer to control bleeding				4.085	0.395

*(Contd...)*

**Table 3:** comparison of gender related to oral hygiene practices

Items	Male (%)	Female (%)	Total (%)	Chi-square	P value
Visit a medical practitioner	9 (14.5)	15 (16.9)	24 (15.9)		
Visit a dentist	17 (27.4)	31 (34.8)	48 (31.8)		
Use some home remedies	19 (30.6)	26 (29.2)	45 (29.8)		
Wait for bleeding to reoccur	13 (21.0)	16 (18.0)	29 (19.2)		
Others	4 (6.5)	1 (1.1)	5 (3.3)		

\*P<0.05 statistically significant

noticed the particular type of toothbrush. Majority 49.0% of individuals change their toothbrush once in 2–3 months, whereas 30.8% change it monthly and 6.4% change when it is spoilt.

The difference between males and females, regarding the practice of changing toothbrush, was statistically significant ( $P = 0.002$ ). 92.2% of the participants clean their tongue and prefer to use a tongue cleaner for this. 80.8% of the people had a good practice of rinsing their mouth after eating. Only 33.8% of the individuals had a practice of using mouthwash; 66.2% of the participants do not use mouthwash, and the difference between males and females, regarding the use of mouthwash, was statistically significant ( $P = 0.047$ ). 60.8% of the individuals never noticed smell from their mouth. In addition to toothbrush, 32.0% used tooth picks, only 13.0% had a good practice of using dental floss, and 5.2% used interdental brushes. Only 27.6% of the participants noticed bleeding in their gums; of them, 31.8% had a good practice of visiting the dentist and 28.8% of the participants waited for bleeding to reoccur. The results of the study have pointed out that educational level was one of the important factors that governed the knowledge, attitude, and oral hygiene practices of the people.

## DISCUSSION

It has been observed that oral hygiene has mostly remained as an ignored and unrealized major social problem.<sup>[2]</sup>

According to the consumer usage and attitudes study done in 2010, the most shocking observation is that nearly half of the Indian population does not use a toothbrush and only 51% brushed their teeth using a toothbrush and toothpaste.<sup>[2]</sup>

Over the past 20 years, a significant amount of emphasis has been made on prevention of diseases rather than the treatment aspect. Healthy teeth can last us a lifetime with the proper preventive dental care. Preventive oral health knowledge, attitude, and

its practice are the important ways of keeping our teeth healthy.<sup>[2]</sup> Hence, in the present study, attempts were made to evaluate preventive oral health knowledge, practice, and attitude of the population of medical students in a private medical college.

In the present study, the knowledge regarding oral hygiene was satisfactory except knowledge about dental floss, whereas poor knowledge on the perception of oral health was reported among engineering students of Tiruchengode.<sup>[5]</sup>

In the present study, only 28.4% [Table 3] of the medical students reported of brushing their teeth twice daily and it was in contrary with the results of Peltzer and Pengpid who reported it to be 67.2% in university students of 26 low-, middle-, and high-income countries.<sup>[6]</sup> On the contrary, Rimondini *et al.*<sup>[7]</sup> described a much higher percentage (92.1%) in Italian University students, whereas Prasad *et al.*<sup>[5]</sup> and Gasgoos *et al.*<sup>[8]</sup> reported small percentage 30.7% and 15.4%, respectively. The present observation may be due to the occupancy of the students in their curricular activities and ignorant attitude toward oral hygiene, considering it as less important.

In the present study, males brush their teeth more frequently than females [Table 3] which were statistically significant ( $P = 0.05$ ), and it was contrary with the result of El-Qaderi and Taani,<sup>[9]</sup> Gasgoos *et al.*,<sup>[8]</sup> and Prasad *et al.*,<sup>[5]</sup> where females brush their teeth more frequently. This difference can attribute to a higher regarding personal hygiene and health care among males.

Hamilton and Coulby found that a high percentage (44%) studied in North Eastern Ontario used dental floss; in contrast, this current study reported only 13% [Table 3] of students used dental floss.<sup>[10]</sup> Reason for this may be the significant resource allocation to health education programs that are carried out in Canada. This emphasizes the urgent need for educating and motivating the public to use this efficient method for oral health

care. Majority of the studied population showed that they clean their tongue either with toothbrush or tongue cleaner. Furthermore, 80.8% [Table 3] of the sample population rinses their mouth after eating food. This very basic method of maintaining oral hygiene is a clear indication of good awareness.

It is noteworthy that 64% [Table 3] of the respondents brushed their teeth using combined motion, which is in contrary to the horizontal motion causing jeopardize of the tooth structure. This finding is in contrary with that of the study done by Zhu *et al.*,<sup>[11]</sup> where 60% of the sample used horizontal motion. Only 37.2% [Table 3] of the subjects use soft brush, which is more than that observed among Zhu *et al.*'s subjects where 27% of the sample use the same.<sup>[11]</sup> 49% change their toothbrush once in 3 months [Table 3], and surprisingly 6.4% [Table 3] change their brush only when it is useless. 33.8% [Table 3] of subjects used a mouthwash. Interestingly enough, they used it to treat malodor. Furthermore, 39.7% reported halitosis. The present study is in contrast with that of an epidemiologic survey of the general population of Japan where 24% of the individuals examined complained about bad breath.

27.6% [Table 3] of the total subjects reported bleeding gums. The present study is in contrary with the studies of Gilbert and Nuttal and Buhlin *et al.* who showed that self-reported bleeding gums were high in percentage.<sup>[12,13]</sup> The present study is in agreement with the studies of Tervonen and Knuttila and Kallio *et al.* who showed that most of the patients did not notice bleeding from gums.<sup>[14,15]</sup>

Visiting a dentist is still not considered a preventive dental behavior, and at present, it only depends on the treatment needs.<sup>[16]</sup> The present study shows that around 75% [Table 2] of the patients visited the dentist only in problem and only 10% [Table 2] of the population visited the dentist on regular basis after every 6 months. These results are similar to the study done by Jain *et al.*, where 54% of the subjects visited the dentists when there is a problem.<sup>[2]</sup> These results are also equivocal with the study conducted by Maryln *et al.* in which 67.9% of the study population reported having had a dental checkup at least once a year in the past 5 years.<sup>[17]</sup>

### Limitations

Student's self-reporting of behaviors may have resulted in over-reporting of proper hygiene practices. Determination of causality is difficult using this cross-sectional study design.

### CONCLUSION

The present study presented a comprehensive overview of oral health-related KAP among medical students in a private medical college in Nalgonda. The awareness about the oral health of the studied subjects stands acceptable. Knowledge about dental floss and frequency of visiting the dentist and brushing frequency was inadequate. More concentration needs to be undertaken regarding oral health care in terms of health education programs.

We, as dentists, will have to keep reinforcing the importance of correcting all aspects related to brushing and flossing along with the importance of regular checkups.

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### REFERENCES

1. Kakkad DN, Murali R, Krishna M, Yadav S, Yalamalli M, Kumar AV. Assessment of oral hygiene knowledge, attitude, and practices among engineering students in north Bangalore: A cross-sectional survey. *Int J Sci Stud* 2015;3:84-9.
2. Jain N, Mitra D, Ashok KP, Dundappa J, Soni S, Ahmed S. Oral hygiene-awareness and practice among patients attending OPD at Vyas dental college and hospital, Jodhpur. *J Indian Soc Periodontol* 2012;16:524-8.
3. Kamran A, Bakhteyar K, Heydari H, Lotfi A, Heydari Z. Survey of oral hygiene behaviors, knowledge and attitude among school children: A cross-sectional study from Iran. *Int J Health Sci* 2014;2:83-95.
4. Kapoor S, Gill S, Singh A, Kaur I, Kapoor P. Oral hygiene awareness and practice amongst patients visiting the department of periodontology at a dental college and hospital in North India. *Indian J Dent* 2014;5:64-8.
5. Prasad AK, Shankar S. Oral health KAP of first year engineering students of KSR College of technology, Thiruchengode, the future rulers. *J Indian Assoc Public Health Dent* 2010;16:143-7.
6. Peltzer K, Pengpid S. Oral health behaviour and social and health factors in university students from 26 low, middle and high income countries. *Int J Environ Res Public Health* 2014; 11:12247-60.
7. Rimondini L, Zolfaneli B, Bernardi F, Bez C. Self-preventive oral behavior in an Italian university student population. *J Clin Periodontol* 2001;28:207-11.
8. Gasgoos SS, Jazrawi KH, Ajrab MG. Dental health knowledge, attitude and behavior among first year university students, Mosul. *Al-Rafidain Dent J* 2007;7:138-52.
9. El-Qaderi SS, Taani DQ. Oral health knowledge and dental

- health practices among school children in Jerash district/Jordan. *Int J Dent Hyg* 2004;2:78-85.
10. Hamilton ME, Coulby WM. Oral health knowledge and habits of senior elementary school students. *J Public Health Dent* 1991;51:212-9.
  11. Zhu L, Petersen PE, Wang HY, Bian JY, Zhang BX. Oral health knowledge, attitudes and behaviour of adults in China. *Int Dent J* 2005;55:231-41.
  12. Gilbert AD, Nuttal NM. Self-reporting of periodontal health status. *Br Dent J* 1999;186:241-4.
  13. Buhlin K, Gustaffon A, Anderson K, Hakansson K, Klinge B. Validity and limitations of self-reported periodontal health. *Community Dent Oral Epidemiol* 2002;30:431-7.
  14. Tervonen T, Knuttila M. Awareness of dental disorders and discrepancy between objective and subjective dental treatment needs. *Community Dent Oral Epidemiol* 1988;34:345-8.
  15. Kallio P, Nordblad A, Croucher R, Ainamo J. Self-reported gingivitis and bleeding gums among adolescents in Helsinki. *Community Dent Oral Epidemiol* 1994;22:277-82.
  16. Gundala R, Chava VK. Effect of lifestyle, education and socioeconomic status on periodontal health. *Contemp Clin Dent* 2010;1:23-6.
  17. Survey of Family Tooth Brushing Practices. Bureau of dental health education. Bureau of research and statistics. *J Am Dent Assoc* 1966;72:1489-91.