

## Original Research

### Comparative Evaluation of Oral Health Status and Oral Hygiene Practices in Students in Clinics V/S Non-clinics. - A Cross- Sectional Study

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#### INTRODUCTION

Oral health is crucial for overall well-being, impacting nutrition, speech, communication, social confidence, and quality of life. Poor oral health is linked to systemic conditions like cardiovascular diseases and diabetes, highlighting its interconnectedness with overall health.<sup>[1]</sup> Preventive measures such as regular check-ups and cleanings reduce the financial burden of dental treatments.<sup>[2]</sup>

Good oral health enhances community productivity and well-being. Despite the benefits, dental diseases like caries and periodontal disease remain prevalent due to inadequate application of preventive practices. Dental caries affects 50% of children aged 5, 52.5% at 12 years, 61.4% at 15 years, 79.2% at 35-44 years, and 87.4% at 65-74 years.<sup>[3]</sup> Root caries prevalence is 3.9% at 35-44 years and 5.5% at 65-74 years.<sup>[3]</sup> Periodontal diseases affect 55.4% of those under 15, 89.2% at 35-44 years, and 79.4% at 65-74 years.<sup>[4]</sup> Oral cancer prevalence is 0.2% in 5-year-olds and 10% at 65-74 years. Fluorosis affects 49.49% of males and 54.10% of females.<sup>[6]</sup>

Public views on oral health vary, with some prioritizing care and others neglecting it.<sup>[7]</sup> Awareness campaigns, dental education, and accessible healthcare services are vital for improving oral health outcomes. The goal is lifelong commitment to oral health through education and accessible services.

This study evaluates awareness of oral hygiene among dental students, who typically have a heightened understanding due to their training.<sup>[8]</sup> Dental students prioritize regular check-ups, hygiene practices, and preventive care, viewing oral health as a personal and professional responsibility.<sup>[9]</sup> As they progress through

dental school, their perspectives evolve from preclinical exercises to patient care.<sup>[10]</sup> This study compares the oral health status and hygiene practices of dental students in clinical and non-clinical settings.

#### Aim

To evaluate the changes in knowledge and attitude of dental students and rate of adaptation of oral hygiene practices over the years in student gaining dental education.

#### Objectives

- To evaluate the extent of oral hygiene knowledge among the students in dental school
- To compare the awareness and adaptation of oral hygiene practices of dental students in clinical and non-clinical environment.

#### MATERIALS AND METHODS

A cross-sectional study was conducted to evaluate the knowledge, attitude, and practices of dental students at a dental college in northern India, comparing non-clinical (1st and 2nd years) and clinical students (3rd year, final year, and interns). A pilot study validated the questionnaire and determined a sample size of 221 using specified statistical parameters. The study included all consenting dental students, excluding those with comprehension issues. Data was collected using a pre-tested questionnaire with 18 items covering knowledge, attitude, and practices related to oral health. Questionnaires were distributed and collected within 3 hours, with student confidentiality maintained through identification codes. Descriptive statistics and chi-square tests were used to analyze the

data, with t-tests assessing differences between preclinical and clinical students, considering ( $p < 0.05$ ) as significant.

## RESULTS

In this study, 62.45% of participants were pre-clinical students (1st and 2nd year), and 37.55% were clinical students (3rd year, final year, and interns). Among the subjects, 60.6% had not heard of water pik, and 84.2% believed the main purpose of brushing was to achieve cleaner and brighter teeth. The scrub method was recommended by 59.7% for children's brushing, and 53.4% considered 2-3 minutes as the ideal brushing time. No significant difference was found between pre-clinical and clinical students regarding knowledge of water pik ( $p=0.630$ ) and the main purpose of brushing ( $p=0.956$ ). However, significant differences were observed for the ideal brushing time ( $p<0.01$ ) and brushing technique for kids ( $p<0.01$ ).

Most students (83.3%) agreed on the importance of regular dental visits, 95.5% believed smoking is harmful to oral hygiene, 78.3% disagreed that teeth can be cleaned without toothpaste, 96.4% linked poor oral hygiene to systemic diseases, and 74.2% supported the benefits of herbal toothpaste. Significant differences were found in beliefs about the benefits of herbal toothpaste ( $p<0.01$ ), but no significant differences were observed in beliefs about regular dental visits ( $p=0.969$ ), smoking and oral hygiene ( $p=0.870$ ), the necessity of toothpaste ( $p=0.316$ ), and the link between poor oral hygiene and systemic disease ( $p=0.459$ ).

In terms of practices, a significant difference was noted in the use of non-fluoridated toothpaste, with 75.37% of pre-clinical students and 83.91% of clinical students using it ( $p=0.009$ ). Brushing twice daily was more common among pre-clinical students (86.57%) compared to clinical students (72.29%,  $p=0.035$ ). Brushing for 2 minutes showed no significant difference between groups ( $p=0.22$ ), nor did the mouth rinse apart from brushing ( $p=0.122$ ). Annual dental visits were reported by 52.9% of subjects, while 47.1% visited the dentist quarterly, with a significant difference ( $p<0.01$ ). A significant difference was also found regarding previous dental treatments, with 74.2% having had treatment compared to 25.4% who had not ( $p<0.01$ ). Horizontal brushing was preferred by more pre-clinical students (67.39%) than clinical students (42.17%,  $p<0.01$ ). Regular use of a tongue cleaner showed significant differences ( $p=0.002$ ), as did the use of hard brushes, with 65.22% of pre-clinical and 81.93% of clinical students using them ( $p<0.01$ ).

Mean knowledge scores were higher among clinical students ( $3.43\pm 1.01$ ) than pre-clinical students ( $2.31\pm 1.17$ ), with a statistically significant difference ( $p<0.01$ ). Attitude scores were higher in preclinical students ( $4.46\pm 0.66$ ) compared to clinical students ( $3.96\pm 0.80$ ), with the difference being statistically significant ( $p<0.01$ ). Practice scores did not differ significantly between pre-clinical ( $5.96\pm 1.67$ ) and clinical students ( $5.64\pm 1.64$ ,  $p=0.159$ ).

**Table 1 – Distribution of respondents based on study year**

	N	%
<b>Preclinical</b>	138	62.45
<b>Clinical</b>	83	37.55

**Table 2 – Year wise distribution and comparison of responses to knowledge related questions**

Question	Response		Pre-clinical	Clinical	Total
<b>Have you heard of water-pik?</b>	<b>No</b>	<b>N</b>	82	52	134
		<b>%</b>	61.19	59.77	60.6
	<b>Yes</b>	<b>N</b>	56	31	87
		<b>%</b>	64.37	35.63	39.4
Chi-square value; p value			.226;.630		
<b>Main purpose of toothbrushing</b>	<b>Prevention of tooth decay</b>	<b>N</b>	22	13	35
		<b>%</b>	16.42	14.94	15.8
	<b>Achievement of cleaner and brighter teeth</b>	<b>N</b>	116	70	186
		<b>%</b>	86.57	80.46	84.2
Chi square value; p value			.003;.956		
<b>Brushing technique for kids</b>	<b>Scrub</b>	<b>N</b>	115	17	132
		<b>%</b>	85.82	19.54	59.7
	<b>Fones</b>	<b>N</b>	23	66	89
		<b>%</b>	17.16	75.86	40.3
Chi square value; p value			85.1;<.01*		
<b>Ideal time required for</b>	<b>.01-2 minutes</b>	<b>N</b>	95	8	103
		<b>%</b>	70.90	9.20	46.6

tooth brushing	2-3 minutes	N	43	75	118
		%	32.09	86.21	53.4
Chi square value; p value			72.9;<.01*		

Table 3 - Year wise distribution and comparison of responses to attitude related questions

Question	Response		Pre-clinical	Clinical	Total
Should dentist be visited regularly	No	N	23	14	37
		%	17.16	16.09	16.7
	Yes	N	115	69	184
		%	85.82	79.31	83.3
Chi square value; p value			.001;.969		
Is smoking good for oral hygiene	yes	N	6	4	10
		%	4.48	4.60	4.5
	no	N	132	79	211
		%	98.51	90.80	95.5
Chi square value; p value			.026;.870		
Can teeth be cleaned without toothpaste	No	N	27	21	48
		%	20.15	24.14	21.7
	Yes	N	111	62	173
		%	82.84	71.26	78.3
Chi square value; p value			1.002;.316		
Poor oral hygiene leads to systemic disease	No	N	4	4	8
		%	2.99	4.60	3.6
	Yes	N	134	79	213
		%	100.00	90.80	96.4
Chi square value; p value			.548;.459		
using herbal toothpaste is equally beneficial	No	N	13	42	55
		%	9.70	48.28	24.9
	Yes	N	124	40	164
		%	92.54	45.98	74.2
Chi square value; p value			47.49;<.01*		

Table 4 - Year wise distribution and comparison of responses to practices related questions

Question	Response		Pre-clinical	Clinical	Total
Type of dentifrices used	Fluoridated	N	37	10	47
		%	27.61	11.49	21.3
	Non-Fluoridated	N	101	73	174
		%	75.37	83.91	78.7
Chi square value; p value			6.746;.009*		
Frequency of brushing	Once daily	N	22	23	45
		%	16.42	26.44	20.4
	Twice daily	N	116	60	176
		%	86.57	68.97	79.6
Chi square value; p value			4.42;.035*		
Duration of brushing	1 minute	N	33	26	59
		%	24.63	29.89	26.7
	2 minutes	N	105	57	162
		%	78.36	65.52	73.3
Chi square value; p value			1.45;.22		
Any other dental aid used	Rinse	N	93	64	157
		%	69.40	73.56	71.0
	Floss	N	45	19	64
		%	33.58	21.84	29.0
Chi square value; p value			2.378;.122		

Frequency of dental visit	Yearly	N	60	57	117
		%	44.78	65.52	52.9
	Quarterly	N	78	26	104
		%	58.21	29.89	47.1
Chi square value; p value			13.20;<.01*		
Previous dental treatment	No	N	26	31	57
		%	19.40	35.63	25.8
	Yes	N	112	52	164
		%	83.58	59.77	74.2
Chi square value; p value			9.27;<.01*		
Method of brushing	scrub	N	45	48	93
		%	33.58	55.17	42.1
	horizontal	N	93	35	128
		%	69.40	40.23	57.9
Chi square value; p value			13.52;<.01*		
Do you use tongue cleaner regularly	No	N	67	22	89
		%	50.00	25.29	40.3
	Yes	N	71	61	132
		%	52.99	70.11	59.7
Chi square value; p value			10.471;.002*		
Type of brush	Soft	N	48	15	63
		%	35.82	17.24	28.5
	Hard	N	90	68	158
		%	67.16	78.16	71.5
Chi square value; p value			7.10;<.01*		

**Table 5 - Comparison of mean total scores for knowledge, attitude and practices related questions based on year of study**

		Mean	Std. Deviation	t value	p value
Practice	Pre-clinical	5.96	1.67	1.416	0.159
	Clinical	5.64	1.64		
Knowledge	Pre-clinical	2.31	1.17	-7.511	<.01*
	Clinical	3.43	1.01		
Attitude	Pre-clinical	4.46	0.66	4.775	<.01*
	Clinical	3.96	0.80		

## DISCUSSION

The American dental association (ADA) recommends tailoring dental visit frequency based on patient health status.<sup>[11]</sup> This study hypothesized that dental students would exhibit positive attitudes and behaviors toward oral hygiene, influencing their peers and family. Dental professionals recognize the link between oral and general health, making timely dental care crucial to prevent health deterioration and economic loss due to dental diseases.<sup>[12]</sup> Hence, it is very important to seek timely treatment and appropriate preventive measures to prevent certain adverse effects on the overall health of the afflicted person.<sup>[13]</sup>

The study compared dental students' knowledge and attitudes over their 5-year course, dividing them based on clinical exposure. However, sample size varied due to senior students' exam commitments, a limitation noted similarly by wasabi et al.<sup>[14]</sup> The first section of the questionnaire assessed knowledge, showing

increased awareness of advanced oral hygiene aids over the years.

Despite understanding flossing techniques, many students did not recognize water-pik.<sup>[15]</sup>

Dental students, typically familiar with brushing from childhood, learned the importance of twicedaily brushing during their course. However, T. Attin's claim that once-daily brushing suffices was disputed, as in-home practices often fail to remove all plaque.<sup>[16]</sup>

The technique of brushing and the time taken for brushing played a major role.<sup>[17]</sup> This study found that clinical students favored the Fones method and increased brushing time to 2-3 minutes, shifting from the scrub method used in initial years. Despite believing in brushing's primary role to clean teeth, senior students brushed less frequently than juniors.

Attitude assessment showed unanimous support for twice-daily brushing and the harmful effects of smoking. Komar K et al. Found higher-grade students

more inclined to quit smoking, recognizing its detrimental health effects.<sup>[18]</sup> A Chinese survey indicated widespread ignorance about toothpaste's role in oral health, with many dental students believing teeth could be cleaned without it.<sup>[19]</sup>

Initially, preclinical students favored herbal toothpastes, but this view changed over time, aligning with Kavya R et al.'S findings that herbal toothpastes offer no significant benefit.<sup>[20]</sup> Most students used non-fluoridated toothpaste, a practice increasing with time despite Wang et al.'S assertion that fluoride is essential for remineralization and caries prevention.<sup>[21]</sup> Moreover, the concentration of fluoride in fluoridated toothpastes is much lower than the toxic levels.<sup>[22]</sup>

The practice patterns section revealed preclinical students visited dentists and received treatments more frequently, possibly due to better oral hygiene understanding and peer exams reducing dental visits. Clinical students used more oral hygiene aids, like tongue cleaners and rinsing after meals, emphasizing the importance of oral hygiene in preventing dental issues.<sup>[23]</sup>

Despite using the best resources, some students did not participate or misunderstood questions, suggesting areas for further study. Dental students' knowledge and practices significantly impact their oral health and societal awareness.

## CONCLUSION

In conclusion, the study underscores the critical role of dental education in shaping students' oral health knowledge, attitudes, and practices. It emphasizes the need for tailored education and accessible dental services to promote a proactive approach to oral health across different demographics. The findings also highlight the significant impact of clinical exposure on dental students' oral health awareness and behaviour, emphasizing the importance of integrating practical experiences into dental education to foster better oral health practices among future dental professionals. Additionally, the study reveals that both male and female dental students can enhance their oral health behaviours. Further emphasis on courses addressing oral health improvement is warranted. Future research should focus on clinically assessing students' oral health.

## SUMMARY

The document titled "comparative evaluation of oral health status and oral hygiene practices in students in clinics v/s non-clinics - A cross-sectional study" emphasizes the significance of oral health and its impact on overall well-being. It highlights the interconnectedness of oral health with systemic conditions and emphasizes the economic implications of maintaining optimal oral health. The study reveals alarming prevalence rates of dental diseases in different age groups, highlighting the need for preventive measures and accessible dental services to mitigate the adverse effects of poor oral health. The

document also discusses the varying perspectives on oral health in different age groups and among medical, non-medical, and dental students, emphasizing the importance of tailored education and accessible dental services across all demographics. The study's objectives include evaluating the extent of oral hygiene knowledge among dental students, comparing the awareness and adaptation of oral hygiene practices between preclinical and clinical dental students, and assessing the differences in oral health knowledge, attitude, and practice between the two groups. The study employed a cross-sectional design and included dental students in a college in northern india, with a sample size calculated based on a pilot study. The questionnaire used in the survey comprised knowledge, attitude, and practice-related questions, with responses analysed using descriptive statistics and chi-square tests to assess statistical differences among frequencies in different groups. The results of the study reveal that a significant proportion of dental students, especially in the clinical category, exhibited better oral health knowledge, attitudes, and behaviours compared to preclinical students. Clinical students showed higher knowledge and more positive attitudes toward oral health, including more frequent dental visits, better brushing practices, and a greater awareness of the importance of oral hygiene. However, the difference in practice-related scores between preclinical and clinical students was not statistically significant. Furthermore, the study found significant differences in various aspects of oral health knowledge, attitudes, and practices between the preclinical and clinical categories, highlighting the importance of clinical exposure in shaping dental students' oral health awareness and behaviour.

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