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## Original Research

### Knowledge about Oral health, hygiene and practices among under-graduate and post-graduatedental students in the state of Jharkhand in Eastern India

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#### ABSTRACT

**Objectives:** To compare Knowledge about Oral health, hygiene and practices among under-graduate and post-graduate dental students in a Health care center at Jamshedpur, Jharkhand, India. **Materials and methods:** Four hundred thirty BDS and sixty MDS students from Awadh Dental College and Hospital of Kolhan University, Jamshedpur, Jharkhand respectively were invited to participate in this survey and they were asked to answer 13 questions, which were meant to evaluate the Knowledge about Oral health, hygiene and practice. The obtained data was analyzed using the Statistical Package for the Social Sciences version 20 software. **Results:** On comparison of the scores of knowledge, attitude, and practice, the mean knowledge score was significantly higher among post-graduates, final years and interns in compare to students of first to third year. The study also showed that female students had better oral health knowledge and showed better oral health practices than male students. Although senior and female students had better knowledge and attitude towards oral health, there was a lack of adequate practice among them. **Conclusion:** Further emphasis on oral health is necessary in undergraduate and postgraduate training to improve oral health knowledge, attitude, and practice among dental students as they will act as role models for oral health education among individuals and community at large.

**Key words:** Oral hygiene; dental students; Attitude; knowledge; practice

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#### BACKGROUND

Having a healthy mouth is a unique and priceless treasure it increases the value of our smile and is regarded as a fundamental human right to maintain a good oral health<sup>1</sup>. Traditionally oral health is defined as an oral status that is free of diseases, which not only makes people look beautiful, but also contributes to the normal function of mouth [2]. In 2016, the Federal Dental International (FDI) Dental World Federation redefined the oral health comprehensively, recognizing that oral health was multifaceted and involved the ability to smell, touch, taste, chew, swallow, smile, speak, and convey a lot of emotions through facial expressions with confidence and without discomfort, pain, and disease of the craniofacial region [3]. Oral health plays a very important role in maintenance of general overall health<sup>4-6</sup>. It is reported that many systemic disease like diabetes, stroke, cardiovascular diseases, digestive diseases, metabolic syndromes,adverse pregnancy

outcomes, and obesity are in close relationship to the overall oral hygiene of a person<sup>7-10</sup>.

On one hand the pro-inflammatory state caused by bad oral hygiene can act as precursor for any systemic disease<sup>11,12</sup>. On the other hand systemic disorders themselves are also capable of development of oral health disorders<sup>13,14</sup>. In spite of having a very important role in a healthy life Oral health care often remains a neglected part of general health care<sup>15,16</sup>. Oral diseases like periodontitis and dental caries are two most prevalent among the major oral health problems which affect the people worldwide<sup>17-20</sup>.

Even after increasing awareness among general masses, the prevalence of some of the oral health diseases are raising in children<sup>21</sup>. Having such a great role in overall health and having such a high prevalence among masses it should be integral part of the comprehensive health promotion system. The importance of it also put extra pressure on the shoulder of dentist to ensure that the awareness of oral

health remain good among the people who they see on regular basis<sup>22,23</sup>.

The cognition and behavior of oral health professionals reflect their understanding of oral preventive measures and practices, which have a great impact on their delivery of oral health care and education to people they see, and then affect the overall oral health of patients<sup>24,25</sup>.

Therefore it is very important for the dental student to have good oral hygiene awareness knowledge as the same will be reflected in the awareness of it among the masses<sup>26</sup>.

People oral health is influenced by not only oral health knowledge but also to some extent by the culture, environment and social customs of local region<sup>29-31</sup>. There are some studies published before about the oral health awareness among dental students in other regions of India and world but none from Jharkhand<sup>2,24,32,33</sup>.

Therefore the present study was conducted in Jamshedpur Jharkhand to assess the knowledge about Oral health and behaviors among the Undergraduate and postgraduate dental students in Jamshedpur Jharkhand.

## METHODS

All the students both Undergraduate and postgraduate of Awadh dental College and hospital were voluntarily invited to participate in the survey in which they were given a set of thirteen questionnaire. The students completed the questionnaires under supervision, and the questionnaires were collected immediately after completion. The ethical committee of kolhan university approved this study.

### Questionnaire design

The participants were asked to fill the information regarding there year of study, specialty (for post-graduates), age and gender first. Subsequently they were given set of 13 Questions which were designed to evaluate the oral health practices, awareness and status of it among

them. The first part was oral health behavior survey, including 6 questions (options for question 5 and 6 are shown in Table 2) 1) how many times do you brush your teeth every day (once or less, twice, three times or more), 2) how long do you brush your teeth every time (1 min or less, 2 min, 3 min or more), 3) how often do you replace your toothbrush (3 months or less, about half a year, never until it cannot be used), 4) when do you visit the dentist (regularly, once suffer from oral diseases, after an oral disease lasts for a long time, until life quality is greatly impacted by oral diseases), 5) how do you brush your teeth, and 6) which oral hygiene methods besides tooth brushing below do you use in your daily life. In the second part, oral health knowledge was studied by 6 questions (options for each question are shown in Table 3) 1) which are the causes of dental caries, 2) which are the causes of bleeding during tooth brushing, 3) which is the influence of dental plaque, 4) which measures can prevent oral diseases, 5) which systemic diseases may be related to oral diseases, and 6) which is more important for keeping good oral health: self-administration or dentists. Finally, we investigated the oral health status by asking students what oral problems they had (Fig. 1). Students were allowed to choose more than one options in several questions.

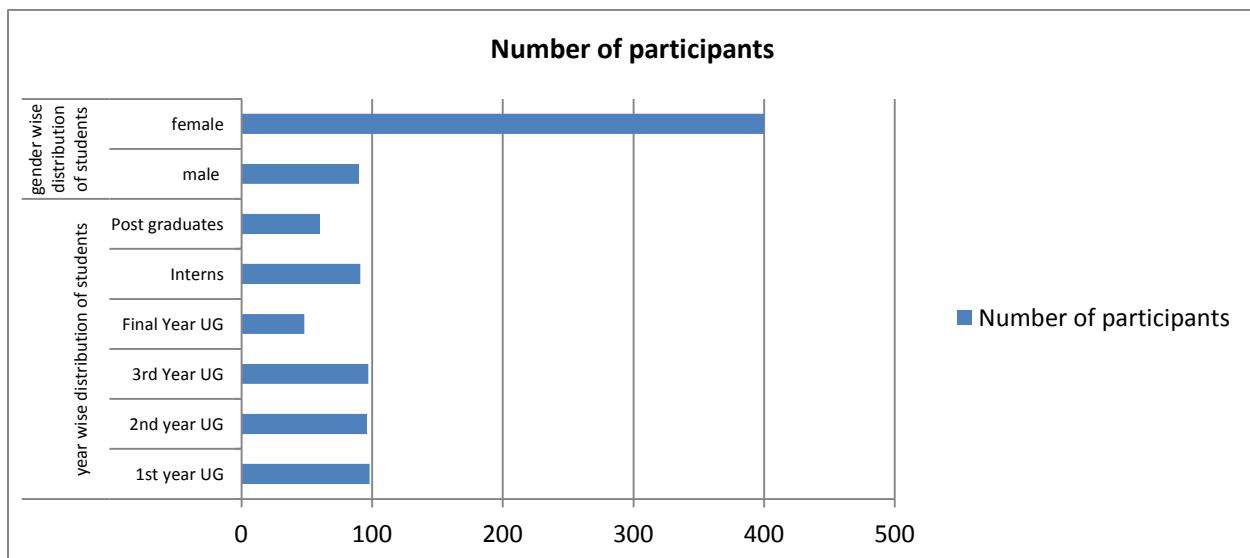
### Statistical analysis

The collected data was analyzed by IBM SPSS Statistics v. 21.0 (IBM, Armonk, NY, USA). Pearson's Chi-square test was used to compare the proportions, and Fisher's exact test was adopted if necessary. A P-value less than 0.05 was considered to be statistically significant

## RESULTS

Total 490 subjects (430 Undergraduates and 60 post graduates student) participated in study. Demographic characteristics of them is shown in the Table 1.

Table 1:



## Oral hygiene Practices

Table 2: Oral hygiene practices of Undergraduate and post graduate dental students

Question (recommended behavior)	Undergraduate students	Post-graduate students	P value
Frequency of daily tooth brushing ( $\geq$ twice)	87.1	97.8	0
Duration of tooth brushing ( $\geq$ 2 min)	84.2	96.7	0
Frequency of replacing toothbrush ( $\leq$ 3 months)	59.4	71.3	0.015
Frequency of visiting the dentist (regularly)	10.4	19.9	0.009
Method of tooth brushing			
Vertical scrub	29.7	35.4	0.238
Horizontal scrub	22.3	6.1	0
Modified Bass technique	6.4	30.9	0
Fones technique	6.4	9.9	0.209
Irregular	35.1	17.7	0
Oral hygiene methods besides tooth brushing			
Dental floss	6.4	40.9	0
Mouthwash	11.4	23.8	0.001
Sugar-free chewing gum	5	4.4	0.806
Toothpick	8.4	4.4	0.114
None	74.3	47	0

As shown in Table 2, there were few significant differences in student's oral health behavior, except for the better habits of post-graduate students in duration of tooth brushing and the method of tooth brushing. More post-graduatedental students brushed their teeth twice or more every day, for no less than 2 minutes every time, replaced toothbrush every 3 months and visited the dentist regularly. As for the method of tooth brushing, 66.3% of the post-graduate dental students followed the right procedure of the vertical scrub or modified Bass technique, whereas more than half of the under-graduate dental students wrongly brushed their teeth horizontally or irregularly. To our surprise, 80.1% of the post-graduate dental students put off visiting the dentist until they were afflicted by oral diseases, as only 19.9 of them visited the dentist regularly.

## Oral Health Awareness

Table 3: Oral health knowledge of post-graduate dental and under-graduate dental students

Questions	post-graduate students	under-graduate students	p value
Causes of dental caries			
Toothpaste without fluoride	15.5	13.9	0.657
Frequent ingestion of sugar	60.2	55.9	0.397
Dysbiosis of oral microflora	58.6	41.1	0.001
Inadequate tooth brushing	53.5	40.6	0.02
Don't know	2.8	3	0.903
Causes of bleeding during tooth brushing			
Natural physiological phenomenon	3.3	8.9	0.024
Periodontal disease	79	47	0
Brushing too hard	33.7	38.6	0.318
Excessive internal heatb	36.5	37.1	0.893
Systemic disease	23.8	20.3	0.414
Don't know	1.1	3	0.359
Influence of dental plaque			
Affecting appearance	45.9	37.1	0.083
Inducing dental caries	59.7	35.6	0
Inducing periodontal disease	79.6	61.9	0
No big deal	1.1	9.9	0
Don't know	1.7	3	0.611
Measures that prevent oral diseases			
Application of fluoride	66.9	23.3	0
Pit and fissure sealing	84.5	25.7	0
Tooth scaling	97.8	91.6	0.008
Don't know	1.7	2	1
Systemic diseases that may be related to oral			

diseases			
Heart disease	56.9	29.2	0
Diabetes mellitus	83.4	43.6	0
Hypertension	57.5	26.7	0
Cancer	60.8	34.7	0
None of the above	3.3	10.9	0.004
Other diseases	30.4	23.8	0.144
Don't know	0.6	2	0.437
Which is more important for oral health: self-administration or dentist?			
Self-administration of oral hygiene	40.3	55.9	0.002

As shown in Table 3, post-graduate dental students had a better knowledge in the causes of caries and periodontal diseases than under-graduate students. For example, more than half of post-graduate dental students thought that dysbiosis of oral microflora (58.6%) and inadequate tooth brushing (52.5%) could cause dental caries, and that fluoride application (66.9%) and pit and fissure sealing (84.5%) could prevent caries, while in under-graduate dental students, these ratios were less than 50%. There was a similar trend in the understanding of periodontal disease. 79.0 and 79.6% of the post-graduate dental students thought that bleeding while brushing teeth or dental plaque correlated with periodontal disease, however, these ratios in under-graduate dental students were only 47.0 and 61.9%, respectively.

### Oral health status

With regard to oral health status, there was no significant difference between the post-graduate dental students and under-graduate students. The rate of self-reported oral health was about 14%. On the other hand, the post-graduate dental students had lower prevalence rate than their under-graduate counterparts in some aspects, such as bad breath, gingival bleeding, and tooth discoloration.. What's more, less than a fifth of students in total thought they had a good oral health (data not shown). According to the self-reported questionnaire, post-graduate students had a healthier mouth, accounting for 23.8%, compared with 11.4% for under-graduate students.

### DISCUSSION

Since dental students are health professionals of future, they are expected to possess accurate oral health knowledge and behavior in their school years. At the same time, their oral health status, which not only affects their own health and life quality, but also is a reflection of their oral health attitude and behavior, is remarkably important. Therefore, it is essential to find out their oral health knowledge, behavior and status, which are of great significance to themselves and patients.

By collection and comparison of the self-reported questionnaires, we aimed to unveil the oral health-related situation in dental schools in Jharkhand and provide a reference for education reform. In oral health behavior, even in the freshmen, approximately 90% of students

brushed their teeth at least twice a day, which was much higher than the ratio of average middle-aged people, indicating that, to some extent, the oral health behavior of Jharkhand new generation was improving compared to their elders. We also found that dental participants performed better and more willing to search for relevant knowledge on their own initiative, as majority of them will take on the job as a dentist in the future. The difference may originate from their varied backgrounds and interests. For instance, some dental students are born in dentist families and exposed to more oral health education. In addition, the ambition to become a dentist may have inspired them to learn more knowledge of oral health since their childhood. Though oral health knowledge of post-graduate dental students was better than that of under-graduate students, both of them did not reach the desirable level. Even among seniors, about 40% students used wrong methods to brush their teeth. There were more than 40% of under-graduate students who weren't aware of the critical role that bacterium and plaque played in the pathogenesis of caries, and about four fifths of them didn't realize that gum bleeding may be a symptom of other systemic diseases. The rate of regular oral examination was only 20%, which was lower than those disclosed in previous studies [34, 35]. Considering their pivotal role in health education, therefore, it is necessary to take some measures to enhance their oral health knowledge. In oral health knowledge, more post-graduate dental students (over 70%) had a good perception of the issues of "plaque inducing periodontal disease" and "bleeding gums suggesting periodontal disease" than under-graduate students (around 50%) in grade 3. Actually, 90% of bleeding gums are caused by periodontitis or gingivitis, and a few of them are caused by systemic diseases. With the improvement of people's living standard, the ratio of gum bleeding caused by lack of vitamin or excessive internal heat has decreased dramatically. Poor cognition in the etiology of periodontal disease resulted in a high prevalence of gum bleeding in 3MS (64.4%). Although it was much lower than the rate of middle-aged people (87.4%) [21], periodontal problems should not be underestimated. Periodontal disease is a risk factor for cardiovascular disease, diabetes, cancer, hypertension and so on, which posed a great threat to human health [36, 37]. Under-graduate students, had a significant lack of understanding of this problem. It seems

periodontal disease and systemic diseases are associated with each other in-depth. Oral examination and scaling, in addition to adequate tooth brushing and regular use of dental floss, are effective methods to prevent periodontal disease. So it is more important to keep a positive health awareness and behavior in daily life. Although post-graduate dental students were superior to their undergraduate companions in many aspects, both of them needed to strengthen their knowledge, attitude, behavior of oral health and finally to be competent to improve the oral health status of their patients and themselves. On the other hand, educators should take the responsibility to elevate students' knowledge and awareness of oral health including preventive measures, and to advance the translation of knowledge into stable behavior regardless of their personal characteristics [41–43]. Nevertheless, the results should be interpreted with some limitations in mind. Although anonymous questionnaires were adopted, the self-reported design might introduce bias on account of the socially desirable answers. Furthermore, its cross-sectional design was unable to clarify the causation of differences. Future study should be committed to unveiling the potential causality. Analyses of factors that conduce to the changes could boost the development of strategies which would improve students' oral health knowledge, behavior and status.

## CONCLUSIONS

Our study revealed that although the postgraduate students performed better than undergraduate students, both of them need to improve their knowledge, behavior and status of oral health.

There should be more emphasis on methods of tooth brushing, oral cleaning measures, awareness of periodontal disease-systemic disease relationship, regular oral examination, and then oral health maintenance.

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