Knowledge, Attitude and Practice on Dental Caries and Oral Hygiene among Medical Students at Janaki Medical College Teaching Hospital

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ABSTRACT

Background: Oral health habits are measures people learn and practice regularly in order to maintain good oral health or prevent oral diseases. The mouth is an integral part of the body, and there are oral manifestations of many systemic diseases that must be managed in both healthy and medically compromised people. Oral health knowledge is considered to be an essential requirement for health-related practices. A good quality of life is possible if students maintain their oral health and become free of oral disease. Dental caries are increasing in developing countries day by day where preventive programs have not been implemented properly. The level of information on oral health knowledge and practices among medical students is unidentified and worthy of investigation in Nepal, and this study aimed at assessing the level of knowledge, attitude and practices on dental caries and oral hygiene among medical students studying at Janaki Medical College Teaching Hospital, Janakpur.

Methods: A standard structured closed-questionnaire was designed and distributed to medical students studying in MBBS programme to assess the knowledge, attitude and practice about dental caries and oral hygiene.

Results: Out of 330 medical students, 145 were male and 185 were female, of which male had the highest knowledge regarding dental caries which was found to be statistically significant. Most of the students had attitude of visiting once in year for dental check up. The highest number of students had once per day brushing habit in early morning with fluoride containing tooth paste.

Conclusions: The present study concluded that the knowledge and practice status of oral hygiene and dental caries among medical students was found to be satisfactory. More oral health education programs must be conducted for the control of oral diseases.

Keywords: Oral hygiene, Dental caries, Medical Student, Attitude, Knowledge

BACKGROUND

Oral health is considered as fundamental to general health and well-being, and its knowledge is considered to be an essential prerequisite for health related behavior [1].

Oral hygiene is the practice of keeping the mouth healthy and clean by brushing and flossing to prevent tooth decay and gum disease [2]. A healthy mouth enables an individual to speak, eat and socialize without experiencing any active disease, discomfort or embarrassment [3]. According to World Health Organization (WHO), “Oral health means being free of chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, tooth decay and tooth
loss, and other diseases and disorders that affect the mouth and oral cavity” [4]. Numerous oral diseases have significant side effects on general health, while systemic conditions may show a mutual influence on oral health and are associated with considerable pain, anxiety and impaired social functioning [5, 6].

Globally, dental caries is considered as a major public health problem due to its high prevalence and significant social impact in important life activities. The microbial community of caries is diverse and contains many facultatively and obligately anaerobic bacteria. *Streptococcus mutans* is considered to be the principle etiological agent of dental caries [7]. The classic description of the cause of dental caries includes three factors: host, bacteria and diet. Dental caries occurs when a susceptible tooth surface is colonized with cariogenic bacteria and dietary source of sucrose or refined sugar is present. Bacterial pathogens produce lactic acid from fermentation of carbohydrates and this acid dissolves the hydroxyapatite crystal structure of the tooth which causes caries [8].

Although dental diseases are not life-threatening but it is detrimental to the quality of life throughout the life span and can have an impact upon the self-esteem, nutrition and health of an individual [5, 6]. Many studies have been carried out to detect risk indicators of dental caries to find out high-risk individuals. Caries history in addition to high titers of cariogenic bacteria, poor oral hygiene, unusual tooth morphology, many multi-surface restorations, chemotherapy or radiation therapy, irregular dental care, cariogenic diet, active orthodontic treatment, and presence of exposed root surface are recommended to be considered in assessing caries risk [9].

Nepalese people have low level of oral health awareness and practice as compared to their western counterparts [10] due to geo-socio-political, economic factors and inadequate health care resources. In Nepal, the oral health system is currently in transition phase. Higher prevalence of the two most common dental disease, dental caries, and periodontal disease are influenced by the lack of dental awareness [11]. The information is limited regarding the knowledge and attitudes about oral diseases and their prevention. Systematic data are needed for public oral healthcare planning.

The most significant period of a student’s life is spent at school and colleges and it is here that their lifetime beliefs and habits develop [12]. Organization can play a chief role in conveying knowledge of the causes and prevention of common oral diseases which provides an ideal setting for promoting good oral health behavior among all age groups. The principle of risk-based management of caries in clinical education has been recommended and is part of the undergraduate curriculum in recent years [13]. It is found that very few studies have collected data concerning the dental caries knowledge among children and health professionals but the information is scanty with concern to medical students.

Due to lack of studies about oral health attitudes and behavior among University medical students in the Janakpur, this study is important in health services. There is paucity of data in scientific literature about oral health knowledge, attitude and oral health behaviour among medical students. The present study seeks to assess the knowledge, attitudes and practices on oral hygiene and dental caries among medical students studying at Janaki Medical College raising public awareness about oral hygiene and dental caries.

**METHODOLOGY**

The present study was conducted from 09-04-2015 to 15-07-2015 at Janaki Medical College Teaching Hospital (JMCTH), Janakpur, Dhanusha which is affiliated to Tribhuvan University, Nepal and recognized by Nepal Medical Council and Nepal Nursing Council. A self-administered standard structured questionnaire was
designed and distributed among 350 medical students studying in Bachelor of Medicine and Bachelor of Surgery (MBBS) programme to assess the knowledge of dental caries and oral hygiene, out of which 330 were considered because they had filled in the questionnaire completely.

A total fourteen-item close-ended questionnaire, consisting of 4 items for knowledge about dental caries (including sugar causes caries, bacteria causes caries, not brushing causes caries, benefits of flouride on dental health), 5 for each attitudes and practice (including visit on dental clinic for dental check up, once in three months, only if in pain, once in years and never visited and frequency of brushing, tooth paste type, brushing time, brushing methods and materials). The questionnaire was constructed in English language.

Only the students of basic science and clinical science studying MBBS programme were included, whereas health professionals such as consultant, medical officer, paramedics and nursing professionals were excluded. Verbal informed consent was taken and the purpose of the study was explained to the participants evidently with assurance of confidentiality. Ethical clearance was taken from the Institutional Ethical Committee.

**Statistical Analysis**

The data were analyzed using SPSS 16.0 version statistical software and Microsoft excel. Frequency distribution was used to show the distribution of knowledge on dental caries cases in the study population. The Chi-square test was used to test for the association of the various factors. The p-value 0.05 was considered statistically significant. Collected data was analyzed by using descriptive and inferential statistics.

**RESULTS**

**Knowledge regarding dental caries among the study population**

Among all respondents, male respondents had more knowledge than female respondents regarding dental caries. 23.63%, 25.25% and 28.48% male respondents had knowledge about sugar, not brushing and bacteria respectively that causes caries and 17.57% had knowledge about benefits of flouride on dental health and rest of them did not know about the subject matter. Similarly, 7.57%, 10% and 7.27% female respondents were having knowledge about sugar, not brushing and bacteria respectively that causes caries and 3.93% had knowledge about benefits of flouride on dental health and rest of them did not know about the subject matter. The results are shown in Table 1.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Knowledge on dental caries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (%)</td>
</tr>
<tr>
<td>Sugar</td>
<td>78 (23.63)</td>
</tr>
<tr>
<td>Not brushing</td>
<td>83 (25.25)</td>
</tr>
<tr>
<td>Bacteria</td>
<td>94 (28.48)</td>
</tr>
<tr>
<td>Benefits of flouride on dental health</td>
<td>58 (17.57)</td>
</tr>
</tbody>
</table>

**Attitudes regarding dental visit**

Among all respondents, 39% respondents visited dental clinic for dental check up, 6% were once in three months, 7% were only if in pain, 46% once in year and 2% were never visited. The results are shown in Figure 1.
Pattern of brushing habit among total population

Out of total respondents, 3.3%, 60% and 36.7% respondents were found as brushing their tooth occassionally, once per day and twice per day respectively. Similarly, 15.2%, 30.6% and 54.2% respondents were brushing their tooth before and after eating, after eating and in early morning respectively. Also, 52% respondents used fluoridated dentrifice and 48% respondents not used fluoridated dentrifice. Among all, most of the respondents had brushing habit once per day and brushed their tooth in early morning. The results are shown in Figure 2.

Pattern of brushing methods and material used

Among all respondents brushing method, 33% respondents followed horizontal, 19% vertical, 48% mixed methods during brushing. Similarly, 66 (20%) respondents used brush and tooth powder, 166 (50.3%) used brush and tooth paste, 52 (15.8%) used finger and tooth powder and 46 (13.9%) used dattiwan and others material for brushing. The results are shown in figure 3 and 4.
Association between use of fluoridated dentifrice and knowledge of dental caries

Among the total respondents, 45.7% respondents had the knowledge on dental caries who used fluoridated dentifrice and those who did not use it had 28% knowledge on dental caries. The knowledge on dental caries was found to be highest among the respondents who used fluoridated dentifrice. The result was statistically significant at 5% level of significance as shown in Table 3.

Table 3 Association between use of fluoridated dentifrice and knowledge of caries

<table>
<thead>
<tr>
<th>Fluoridated dentifrice</th>
<th>Knowledge on dental caries</th>
<th>Total (No)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>(%)</td>
<td>No.</td>
</tr>
<tr>
<td>Used</td>
<td>79</td>
<td>(45.7)</td>
<td>94</td>
</tr>
<tr>
<td>Not used</td>
<td>44</td>
<td>(28.0)</td>
<td>113</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>(37.3)</td>
<td>207</td>
</tr>
</tbody>
</table>

Association between brushing habit and knowledge of dental caries

Among the respondents, 36.4%, 37.9% and 36.4% respondents had knowledge on dental caries with occasional, once per day and twice per day brushing habit respectively. The knowledge on dental caries was found to be highest in those respondents who had once per day brushing habit. The result was not statistically significant at 5% level of significance. Similarly, 58%, 28.7% and 36.3% of respondents had knowledge on dental caries with before and after eating, after eating and early morning brushing time respectively. The knowledge on dental caries was found to be highest in those respondents who brushed once per day. The result was not statistically significant at 5% level of significance.
Caries was found to be highest among the respondents who had before and after eating brushing habit. The result was statistically significant at 5% level of significance (Table 4).

<table>
<thead>
<tr>
<th>Table 4 Association between brushing habit and knowledge of dental caries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brushing habit</strong></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Occasional</td>
</tr>
<tr>
<td>Once per day</td>
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<tr>
<td>Twice per day</td>
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<tr>
<td>Before and after eating</td>
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<tr>
<td>After eating</td>
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<tr>
<td>Early morning</td>
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</tbody>
</table>

**Association between knowledge on caries and brushing practices**

The knowledge on dental caries was found to be highest among those respondents who followed vertical brushing methods and who used dattiwan and others materials during brushing. The result was statistically significant at 5% level of significance. The results are shown in Table 5.

<table>
<thead>
<tr>
<th>Table 5 Association between knowledge on dental caries and brushing practices</th>
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</thead>
<tbody>
<tr>
<td><strong>Brushing methods</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
</tr>
<tr>
<td>Vertical</td>
</tr>
<tr>
<td>Mixed</td>
</tr>
<tr>
<td><strong>Brushing materials</strong></td>
</tr>
<tr>
<td>Brush and Tooth Powder</td>
</tr>
<tr>
<td>Brush and Tooth Paste</td>
</tr>
<tr>
<td>Finger and Tooth Powder</td>
</tr>
<tr>
<td>Dattiwan and Others</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Oral health is an integral component in the general health of an individual and has become a major public health issue with a substantial social impact [14]. As William Osler said mouth is the mirror of general health [15]. Optimal health cannot be accomplished independent of oral health. Poor oral conditions may adversely affect general health and certain medical conditions may have a negative impact on oral health [16]. Hence, oral health knowledge is considered to be a necessary requirement for health-related behaviour.

Nowadays, medical field has become a joint venture of various healthcare care workers. Doctors, nurses, pharmacists and technicians work in collaboration to provide complete medical care to the patient and society.
There is a high prevalence of oral disease in the developing nations. In Nepal, there is scarce data on the oral health status of medical students. Therefore, the present study was focussed on the knowledge regarding oral hygiene and dental caries among the study population. Knowledge acquisition regarding oral health involves complex cognitive processes: perception, learning, communication, association, and reasoning [17]. It was found that the total knowledge on dental caries among the gender was 37.3% and was higher in male than female which was found to be statistically significant at 5% level of significance (p=0.0001). This may be due to knowledge on oral hygiene in male than female.

This study highlights that 31.2% respondents knew that sugar causes caries, 35.2% knew that not brushing teeth causes caries, 35.8% knew that bacteria cause caries and 21.6% had knowledge about benefits of fluoride on dental health. The knowledge on dental caries in those who used fluoridated dentrifice was 45.7% which was found to be statistically significant at 5% level of significance (p=0.001). Fluoride has an anti-cariogenic effect that prevents caries and can even reverse the earliest stages of tooth damage. A skewed distribution of caries is evident in epidemiological studies, as a considerable percentage of the population exhibits significantly more caries and runs a high risk of developing new carious lesions, even in fluoridated areas [18, 19].

The present study showed the highest number of respondents had attitude of visiting once in a year for dental check-up which indicates the negative attitude towards dental care. An attitude is a relatively enduring organization of beliefs around an object, subject or concept which predisposes one to respond in some preferential manner. It is an acquired characteristic of an individual. People demonstrate a wide variety of attitudes toward dental care and dentists. 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 [20-23].

This study found that the highest number of respondents had once per day brushing habit and also had more knowledge on caries, which was not statistically significant at 5% level of significance (p=0.962). This may be due to lack of knowledge about brushing twice a day is good for maintaining the proper oral hygiene. A similar finding was also obtained in study conducted by Baral et al [24]. This present study also establishes the knowledge on dental caries was highest among the respondents who had before and after eating brushing habit which was statistically significant at 5% level of significance (p=0.002).

In this study, the highest number of respondents followed mixed brushing methods. A study conducted by Baral et al [24] also obtained the similar findings. The present study also found the knowledge on dental caries was highest among those respondents who followed vertical brushing methods and who used dattiwan and others materials during brushing, which is statistically significant at 5% level of significance. The vertical brushing method considers manual dexterity to rotate bristles from the gums towards and across the teeth which helps to prevent from caries. Dattiwan is a stem or root of the plant which becomes brushlike after treatment and is suitable for oral hygiene [25]. Although the medical students have good knowledge of benefits of dattiwan using, but the practice of dattiwan was not so frequent among the students of medical college.

Dental health care education in the University curriculum can have a strong positive influence on oral-health related attitudes and behaviour. These results indicate the need for intervention through oral health education and promotion to alter individual’s behaviour related to dental health. The present study data showed the knowledge and practice status of medical students which
helps to determine the appropriate implementing programs to achieve optimal oral health care. More oral health education programs in community and schools must be carried out for the control of oral diseases.

CONCLUSION

Oral health is the standard of health which enables an individual to eat, speak and socialize without active disease and discomfort which contributes to general well-being. Oral disease qualifies as major public health problems owing to their higher prevalence and considerable social impact.

This study was the formal assessment of dental health knowledge and oral-health related behaviour of medical students. The present study concluded that male respondents showed relatively good knowledge of oral hygiene and dental caries than female respondents which was found to be statistically significant. It is possible that female had not especially knowledge about dietary factors causing caries. However having knowledge does not guarantee that it will be effectively used; this requires effective campaigning within community through various medical associations and organizations. Adequate knowledge, good behaviors and practices of oral hygiene among medical students are further supposed to be well-equipped with sound knowledge, attitudes, and behavior regarding the oral health to their patients in expectations. With proper knowledge of oral health behavior, medical students can play an important role in the oral health education of individuals and groups and act as role models for patients, friends, families and the community at large in future. The present study also advised that knowledge regarding oral health care and its importance should be incorporated into curriculum of all levels of the study.

Health education should focus on responsibilities of dental awareness among individuals, parenteral responsibilities, community and society for oral health which give practical and emotional support to general public with regard to oral hygiene habits which could be an asset in developing counties like Nepal. Raising public awareness about dental check-up may assist in early diagnosis. The knowledge about basic oral hygiene measures is a must for every professional other than dentists. The change from an unhealthy attitude to a healthy attitude will occur when adequate information and motivation are provided; and adequate practice of the measures will be adopted. The present study cannot investigate the actual oral health status of medical students which is the limitation of this study.

COMPETING INTERESTS

The authors declare that they have no competing interests concerning the work reported in this paper.

CONTRIBUTIONS

KY - Involved in writing first draft of manuscript, data collection, statistical analysis and revision of manuscript finalized.

SP - Designed the concept of the study, involved in preparation of manuscript as well as decisive revision of the final manuscript.

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