

## Dental Anxiety and Its Possible Effects on Caries Prevalence Among Group of Dental Students In Kathmandu Medical College

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### ABSTRACT

**Introduction:** The prevalence of high dental anxiety varies from 2% to 30% worldwide depending on the study population, the methods applied, and the cut-off scores used. There is strong evidence that dental anxiety is associated with dental attendance; it has been reported that individuals with higher dental anxiety tend to visit the dentist irregularly, which in turn may lead to deterioration in oral health. Studies have demonstrated that dental anxiety is associated with poor self-reported and clinically assigned oral health, more decayed and missing teeth, fewer filled teeth and worse periodontal health. Dental students are the future dental doctors who will be dealing with fearful patients in future. Knowing the facts on dental anxiety will have positive impact while treating and dealing such patients. **Objectives:** The overall objectives of the study were to assess level of anxiety and its possible effect on prevalence of caries among dental students studying at Kathmandu medical college and Dental hospital. **Specific:** To access the level of anxiety among dental students of different years (from first year to final year) along it was further focused to analyse the level of anxiety among male and female dental students. **Methodology:** A cross sectional study was conducted to choose a random convenient sample. The data were collected from dental students of first year to final year studying at Kathmandu medical college dental hospital–KMCDH. A structured questionnaire based on modified dental anxiety scale was used to collect the data. Patients were examined for dental caries prevalence using decay, missing and filled teeth (DMFT) index according to World Health Organisation guidelines. **Results:** The highest MDAS was seen among the younger batches and the mean values for MDAS declined with higher batch of dental students. The mean dental anxiety score for males was 8.9 and 15.5 for females. The difference was statistically significant the most fearful stimulus in dental clinic for both genders was local anesthetic injection, followed by drilling of teeth. **Conclusion:** Dental anxiety remains a significant problem for many patients of both gender and different age groups of examined students. Dental anxiety has a negative effect on oral health status by increasing the prevalence of decayed teeth. Further studies should be carried out using large random samples before generalizing this conclusion.

**Key words–Dental anxiety, Dental students, Modified Dental anxiety scale**

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### INTRODUCTION

Oral health is one of the most important integral parts of general well-being and a significant public health issue. Despite increased awareness among dentists and patients of a preventive approach to oral diseases, and innovations in dental equipment and pain reduction, dental anxiety always persists<sup>1,2</sup>. Dental anxiety (DA) is described as a state of excessive and unreasonable apprehension that “something dreadful is going to happen in relation to dental treatment, and it is coupled with a sense of losing control”. Dental fear is related to dental anxiety and is described as a normal unpleasant emotional reaction to perceived threat or danger

in a dental situation<sup>3,4,5</sup>. The concepts of dental fear and dental anxiety are frequently used interchangeably in dental studies, implying “strong negative feelings associated with dental treatment”. Several psychometric tests have been developed to differentiate people with and without dental anxiety. Along with single-item questions, Corah’s Dental Anxiety Scale (DAS), the Modified Dental Anxiety Scale (MDAS), and Kleinknecht’s Dental Fear Survey are the most commonly used tools in epidemiological studies to measure dental anxiety in adults, although none of the existing instruments are regarded as a gold standard<sup>6,7</sup>. The prevalence of high dental anxiety varies from 2% to 30% worldwide depending on the study

population, the methods applied, and the cut-off scores used<sup>8</sup>. There is strong evidence that dental anxiety is associated with dental attendance; it has been reported that individuals with higher dental anxiety tend to visit the dentist irregularly, which in turn may lead to deterioration in oral health<sup>9,10</sup>. Studies have demonstrated that dental anxiety is associated with poor self-reported and clinically assigned oral health, more decayed and missing teeth, fewer filled teeth and worse periodontal health<sup>11-14</sup>. Dental students are future dental doctors who will be dealing with fearful patients in the future. Knowing the facts on dental anxiety will have a positive impact while treating and dealing with such patients. Considering those facts this study is intended to check the level of dental anxiety using MDAS and caries prevalence following the WHO guidelines for DMFT (Decayed, Missing, Filled treatment needs) index among the undergraduate dental students at Kathmandu Medical College. This study imparts the level of anxiety and caries prevalence among the dental students of a different year studying at Kathmandu Medical College and Dental Hospital, Duwakot, Bhaktapur, Nepal.

## METHODOLOGY

A cross-sectional study was done with a sample size of 246 adults. The study consisted of 57 males and 189 females studying from the first year to the final year at Kathmandu Medical College Dental Hospital (KMCDH). This dental college provides dental education as well as health care facilities for a large group of population. A well-structured questionnaire was used for the collection of the data. The questionnaire composed of two parts: the first part included the demographic details of the patients. The second part consisted of the 5-item modified dental anxiety scales (MDAS) of the Humphris G et al which is an improvement over a 4-item Corah Dental Anxiety Dental Scale (DAS), where an important item regarding local anesthetic injection was added. This Modified Dental Anxiety Scale (MDAS) is a questionnaire that contains five multiple-choice questions related to dental anxiety. Each question has five possible answers, the answers for each item range from "not anxious" with a score of 1 to "extremely anxious" with a score of 5. The scores are summed together with a minimum score of 5, and a maximum of 25. The MDAS is a reliable, valid, has good psychometric properties, and require just 2-3 minutes to complete, The MDAS has been validated in the United Kingdom and a number of other countries. A cut-off value of 19 and above was used in the MDAS to indicate high dentally anxious medical students studying in the Kathmandu Medical College and dental hospital who may require special attention in the college.

## Inclusion and Exclusion Criteria

All those students willing to participate in the study and patients who were consented to examine were only included in the study whereas none of the respondents denied participating and provided an accent to participate in the study. Thus, all the students from the first year to the final year were included in the study.

## Clinical Examination

After the acceptance of written consent from each individual, the patients filled the questionnaire. The dental caries status was evaluated by using the decayed (D), missing (M) and filled (F) teeth (DMFT) index, according to WHO guidelines using plane mouth mirror and an explorer under good light. Dental radiographs were not included and third molars were excluded. Decayed teeth (D) were defined as the number of teeth with primary and secondary caries, missing teeth (M) were defined as a number of missing teeth, irrespective of the reason, filled teeth (F) was defined as the number of teeth filled, including all types of filling materials and crowns. The individual values of D, M, and F for each subject then the sum of these three values gave the corresponding DMFT score, which is an indicator of dental disease and previous dental treatment experience until the examination was taken. Ethical approval for the study was obtained from the Institutional Review Committee of Kathmandu Medical College.

## Statistical Analysis

All the data collected by a set of questionnaires were entered in MS- Excel and coded and imported in SPSS version 18, for further statistical analysis

## RESULT

The study population sample consisted of 246 dental students, 23.1% males, and 76.9% females. Only 44 patients (8.8%) showed high dental anxiety. Table I shows the distribution of student's respondents according to gender and academic year. The year-wise student distribution was from the first year to the final year. The involvement of female students in the study process was found greater as compared to that of males. The highest MDAS was seen among the younger batches and the mean values for MDAS declined with a higher batch of dental students, with a statistically significant difference between batches of students, regarding the association between dental anxiety and gender, dental anxiety was higher among females compared to males. The mean dental anxiety score for males was 8.9 and 15.5 for females. The difference was statistically significant for the most fearful stimulus for both genders was a local anesthetic injection, followed by drilling of teeth (Table II). The least fearful situation for both genders was picking up an appointment for a dental procedure in the following day. Individual with high dental anxiety had a statistically significant higher number of decayed teeth however there were no statistically significant differences for missing (M), filled (F) teeth and total DMFT index scores between high and low dental anxiety groups (Table III).

Students	Male	Female	Total
Final Year	7(26%)	19(74%)	26
Fourth Year	14(18%)	61(82%)	75
Third Year	9(20%)	35(80%)	44
Second Year	16(31.37%)	35(68.6%)	51
First Year	11(22%)	39(78%)	50
Total	57(23.1%)	189(76.9%)	246

**Table I: Distribution of students residence according to sex**

Questionnaire item (MDAS)	Males	Females	p-value
If you went to your dentist for Treatment Tomorrow, how would you feel?	1.12	2.54	.002
If you were sitting in the Waiting Room, how would you feel?	1.4	3.51	.011
If you were about to have a Tooth Drilled, how would you feel?	1.8	4.1	.001
If you were about to have your Teeth Scaled and Polished, how would you feel?	1.52	2.25	.001
If you were about to have a Local Anesthetic Injection in your gum, how would you feel?	2.2	4.5	.0011
Total mean score according to gender.	8.9	15.5	.04

**Table II: Single item MDAS mean according to gender and academic year**

Variable	Low dental anxiety MDAS<19	High dental anxiety MDAS≥19	p-value
Decayed (D)	2.25	4.14	.02
Missing (M)	1.4	2.52	.41
Filled (F)	4.1	2.7	.1
DMFT	7.75	9.36	.09

**Table III: Mean decayed, missing and filled permanent teeth by low and high dental anxiety**

**DISCUSSION**

The prevalence of dental anxiety among the students was 8.8%. This result is within the range between 5-20% reported from other countries such as Saudi Arabia (8.5%)<sup>13</sup>, Netherlands (17.9%)<sup>11</sup>, United Kingdom (11.6%)<sup>15</sup>, USA (12.2%)<sup>16,17</sup>, Australia (9.5%)<sup>18</sup>, China (8.7%)<sup>19</sup> and Denmark (10.2%)<sup>20</sup>. A lower range of dental anxiety was seen in the present study. This may be due to the fact that this study was carried out among the dental students studying and working at the same dental college.

Since, many individuals with extremely high dental anxiety would not attend or will to study dental education voluntarily; this may have resulted in an underestimation of the prevalence of dental anxiety. This study population does not reflect dental anxiety among all Nepali adult student population, and further studies that include more representative samples are required. It has been found out that the dental anxiety scale among the dental students significantly decreased with the higher batch students. Various cross-sectional studies have reported that the prevalence of dental anxiety decreases with age<sup>15,21</sup>. This study revealed that females were significantly more anxious than males. The result has an agreement with many studies that assessed dental anxiety between both genders and reported that the prevalence of dental anxiety was higher in females than in males<sup>15,16</sup>. However, some studies failed to find a significant difference in dental anxiety between genders<sup>17</sup>. The explanation for this gender difference may be due to actual differences in anxiety levels between both genders, a greater readiness among females to acknowledge feelings of anxiety, or minimum level to cope with the dental situation, or may simply reveal gender differences in self-reporting dental anxiety with male's denial or maybe a combination of multiple factors. On the basis of MDAS, needle injection during dental treatment was found to be the most common anxiety-producing stimulus for both genders. This is consistent with other studies<sup>3</sup>. The authors explained these situations as a four-dimension problem. The dimensions were in terms of fear of pain, fear of local anesthetic solution, fear from acquired diseases and physical injury. Avoidance of necessary dental treatment is said to be related to dental anxiety, furthermore, if anxious dental patients attend for an emergency dental visits, they will likely avoid necessarily follow up appointments to complete dental treatment properly<sup>22</sup>. This dental avoidance behavior will lead mostly to more extensive development of carious lesions, which ultimately requires more invasive and painful treatment, that will augment the level of dental anxiety and the patient will be in the zone of "vicious cycle of fear". The effect of dental anxiety on caries prevalence was discussed by many researchers and found that avoidance of dental treatment was highly correlated with anxiety scores and with increased caries morbidity. The present study supports these findings and was related to the fact that the one with high dental anxiety had a statistically significant higher number of decayed teeth (D), compared with low dental anxiety patients. It is found that individuals with high dental fear, had a statistically significantly higher number of decayed and missing teeth, but statistically significant lower number of filled teeth. The present study supports its finding regarding the differences in DMFT between both groups and precisely explained that the dentally anxious patients had significantly more missing and fewer filled teeth compared to low dental fear subjects. In general, dental anxiety had a negative effect on the utilization of dental services and oral health status. So, breaking this "vicious cycle" is important to improve the oral health status of those fearful individuals. This needs efforts from both the dentists and patients. The dentists should have

more understanding, patience, higher communication skills, and behavioral management procedures for better treatment outcomes. From the patient perspective, they should be able to recognize and control their fears from dental treatment and improve dental utilization behaviors to improve their oral health status. If this approach fails, pharmacological means may be used to solve this problem.

## CONCLUSION

Dental anxiety has a negative effect on oral health status by increasing the prevalence of decayed teeth. It has been found out that the dental anxiety scale among dental students significantly decreased with the higher batch students. In order to generalize the results of such studies among adults, future studies should be carried out using larger random samples.

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