

# PREVALENCE OF DENTAL ANXIETY AMONG SCHOOL GOING CHILDREN OF THE AGE GROUP 14-16 YEARS IN ABBOTTABAD AND ISLAMABAD, PAKISTAN – A CROSS-SECTIONAL STUDY

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## ABSTRACT

**Objectives:** To determine prevalence of dental anxiety among school going children of the age group 14 to 16 years old, using Modified Dental Anxiety Scale (MDAS).

**Materials & Methods:** This cross-sectional study utilized MDAS; The study was completed in time period of 3 months (September 2021 to -November, 2021). which consists of five questions to assess level of dental anxiety. Non-probability volunteer response sampling technique was used. Data was collected through online Google survey form of MDAS and forwarded to the administration and coordinators of different schools' in Abbottabad and Islamabad. Each questionnaire was filled by the students of 8th, 9th and 10th class. After assessment of dental anxiety among the required age group, comparison between the anxiety levels of males and females and between school children of two cities was done. Data was analyzed using IBM-SPSS statistical software, version 24.0, with significance levels at  $P < 0.005$ .

**Results:** This study included 374 participants from the two cities of Pakistan i.e. Abbottabad and Islamabad. A greater percentage of the inclusion criteria were found to be moderately anxious (35%). Females (58%) were found to be more anxious as compared to males. Mean level of moderate anxiety was greater among the children of Abbottabad while in Islamabad the children were found to be highly and severely anxious.

**Conclusion:** Prevalence of dental anxiety in this patient sample was found to be moderately high as compared to previous studies. Dental anxiety surveys such as MDAS are an easy and reliable way to assess anxiety. Interpersonal collaboration is always beneficial for the patient. Furthermore, comparison of anxiety levels between the school children of two cities give a clearer picture about dental health protocols.

**Key words:** Assess, Dental anxiety, Prevalence, MDAS

## INTRODUCTION

Anxiety is defined as “apprehension of danger and dread accompanied by restlessness and ten-

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sion attached to a clear unidentifiable stimulus”. Despite the advances in technology and awareness regarding oral health, greater percentages of people suffer from dental anxiety which is ranked fourth among common fears and ninth among intense fears.<sup>1</sup> Dental anxiety is characterized by a physical and/or emotional response to a perceived threat. In the dental office setting, this perceived threat could be a painful injection or procedures like a tooth being

drilled or extracted.<sup>2</sup>

Avoidance of dental treatment is correlated to dental anxiety. Researchers have found that dentally anxious people avoid dental care, therefore leaving their oral health issues to worsen. Poor oral health results in shame and avoidance of dentist until the experience of pain leaves the patient with no other option other than seeking treatment. This pattern reinforces the fear of dental treatment and feelings of dental anxiety.<sup>3-5</sup>

Dental fear and anxiety are not commonly directed towards the dental practitioner but more towards the treatment and the possibility of pain. Patients with dental fear are a challenge for dentist and dental staff, causing more stress responses.<sup>6</sup>

Dental anxiety affects significant proportion of children. Such children are mostly infrequent users of dental services and have a higher prevalence of oral health problems as compared to children who does not experience dental anxiety.<sup>7</sup> The British National Children's Dental Health Survey found that the proportion of children who were dentally anxious steadily increased through the primary school years and then leveled off during the secondary school years to about 50% of the total population.<sup>8</sup>

Understanding dental fear and anxiety in young children is an essential part of reducing their fear and anxiety. Children who are relaxed during dental treatment may display positive behavior, such as smiling and chatting as compared to fearful children who behave hesitantly or cautiously, while some may defend themselves and disrupt the treatment procedures in extreme cases.<sup>9</sup>

Dental health professionals must be able to identify patients who have special psychological needs. MDAS may be helpful in identifying such patients.<sup>10</sup> MDAS was proposed by Humphris et al. to improve CDAS by adding a question about getting local anesthetic injections and requesting the possible replies to each question in a Likert scale ranging from not anxious to extremely anxious.<sup>11</sup>

If patients with dental anxiety are not managed appropriately, it is quite possible to establish what has been referred to as a 'vicious cycle of dental fear'.<sup>12</sup> Epidemiological studies of the general population show prevalence rates of dental anxiety ranging from 10-20% in the general population World Wide.<sup>13</sup>

Thus, the objective of present study was to assess level of dental anxiety among 14 to 16 years old; in the schools of Abbottabad and Islamabad, based on MDAS and compare anxiety levels among school going male and female children, thereby identifying the influence of determinant factors associated with anxiety.

## MATERIALS & METHODS

This cross-sectional study was carried out among school going children of the age group 14 to 16 years using MDAS in order to assess their level of dental anxiety and compare the results of anxiety level based on gender and between these school children of the two cities i.e. Abbottabad and Islamabad. Non-probability volunteer response sampling technique was used. Data was distributed via online Google forms to the school administrations' and further distributed by the school coordinators into the relevant subjects of this study i.e. students of class 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup>. *Inclusion criteria:* school going males and females of the age group 14 to 16 years in two cities i.e. Abbottabad and Islamabad. *Exclusion criteria:* anyone below the age of 14 years and above the age of 16 years, those who failed to provide consent and those who failed to answer the questionnaire fully. The study was completed in time period of 3 months (September 2021 to -November, 2021).

Informed consent was obtained. The questionnaire included demographic data i.e. age, class, school name and city of residence along with the modified dental anxiety scale. Figure 1 (MDAS) was used to assess dental anxiety.<sup>3</sup> Participants were asked to respond to the questions based on their level of agreement. Using a Likert scale not anxious is equal to a score of 1; slightly anxious is equal to a score of 2 and so on. The sum of five questions can range from 5 to 25, with 5 being not anxious and 25

**Figure 1: Total score is sum of all 5 questions, ranging from 5 to 25. A cut-off of 19 or above indicates high dental anxiety.**

Modified Dental Anxiety Scale (MDAS): Scoring Instructions
Not anxious = 1
Slightly anxious = 2
Fairly anxious = 3
Very anxious = 4
Extremely anxious = 5

being extremely anxious.<sup>2</sup>

All the questionnaire responses were recorded and uploaded into Microsoft Excel and subjected to statistical analysis. Descriptive statistics were used in order to verify the frequency distribution of all variables. The data was analyzed using the IBM SPSS statistical software, version 24.0, with significance levels at  $P < 0.005$ .

## RESULTS

The present study involved 374 participants. All the participants were students of the classes 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> and the age group 14-16 years. Both males (41.2%) and females (58.8%) were a part of this study, residing in the cities Abbottabad (49.2%) and Islamabad (50.8%). Majority of the participants were found to be moderately anxious. Level of anxiety was found to be higher in females, age group of 15 years and in the city of Abbottabad.

A comparison between the anxiety level of school going children in two cities i.e. Abbottabad and Islamabad was made and it was found that the school going children were moderately anxious in the city of Abbottabad while in Islamabad they were found to be highly and severely anxious.

An association between age, gender, city and level of dental anxiety was also found and the results were compared. Females of each age group were found to be more anxious as compared to the males .

A comparison between the anxiety levels and age was done and was found that at all age groups ,majority students were moderately anxious followed by mildly anxious . In age group of 14 years most of the students are highly and severely anxious.

## DISCUSSION

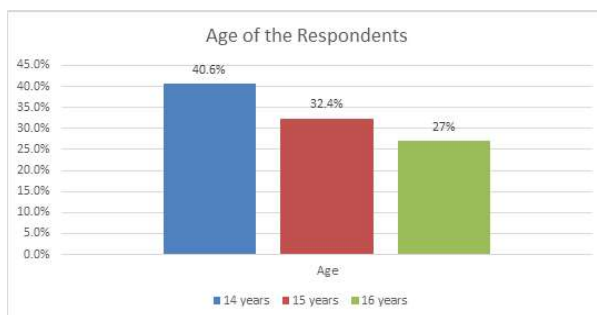


Figure 1: Age distribution of the Respondents

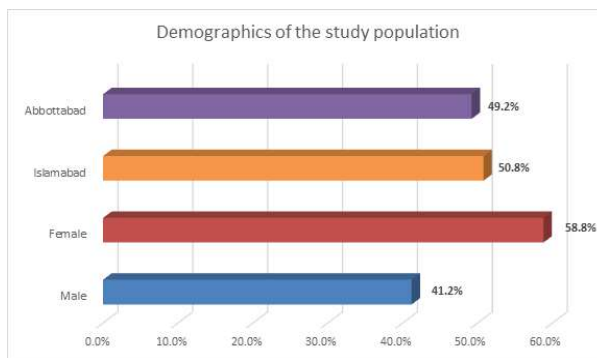


Figure 2: Demographics of the Respondents

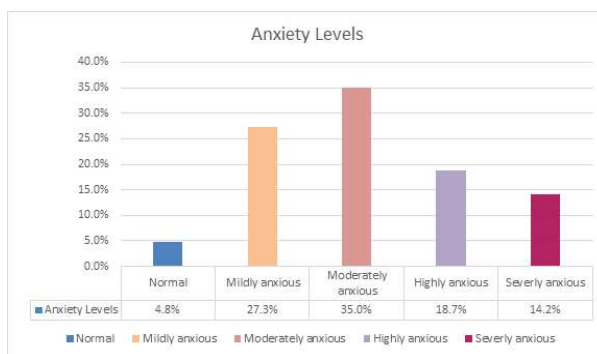


Figure 3: Anxiety Levels among the Respondents

Table 1: Anxiety Levels Among Cities

City	Normal	Mild Anxiety	Moderate Anxiety	High Anxiety	Severe Anxiety	Total	p-value
Islamabad	9	43	60	42	36	190	0.0115
Abbottabad	9	59	71	28	17	184	

Table 2: Anxiety Levels Among Gender

Gender	Normal	Mild Anxiety	Moderate Anxiety	High Anxiety	Severe Anxiety	Total	p-value
Male	12	54	51	28	9	154	0.0001
Female	6	48	80	42	44	220	

Dental anxiety and dental phobia represent a significant challenge for both patients and dentists. These both terms are used interchangeably and it is recommended that the dental practitioners assess both during clinical assessment using a well-structured scale.<sup>13</sup> When patients are anxious of the treatment they are to receive, their cooperation and compliance reduces to a level that may imperil the success of intervention.<sup>5</sup> Despite the advances made in modern dentistry, anxiety about dental treatments remains prevalent.<sup>12</sup>

According to previous researches, dental phobia has been associated with reduced or irregular attendance of dental clinic or in worse cases; avoidance of dental care altogether.<sup>5</sup> Such patients will only make a dental appointment if their pain becomes unbearable.<sup>6</sup>

It is important to assess level and triggers of dental anxiety in order to manage the patient well.<sup>15</sup> Knowledge of patient's anxiety before treatment can be an aid to the dentist in two ways i.e. he can become aware of what to expect from the patient and what measures can he take to help alleviate patient's anxiety.<sup>4</sup> Newton and Buck have made great contributions towards the development of several reliable and rational measures of dental anxiety<sup>5</sup> and commented positively on MDAS which is a simple, valid and good predictor of patients' distress in the dental operatory.<sup>4</sup>

When questioned, patients label dental anxiety as the second biggest trigger for psychological distress at 21% just after public speaking at 27%.<sup>6</sup> Majority of the children included in this study were found to be moderately anxious (35%) to any kind of dental treatment. Similar study conducted in Dubai found that the prevalence of child dental anxiety was 48%. By contrast, in Finland, close to half of the children (44-55%) were reported as 'fearful of dental treatment in general or because of specified dental procedures'.<sup>8</sup> The possible reason for high level of dental anxiety can be attributed to high percentage of young patients who are usually apprehensive.<sup>14</sup>

A negative correlation was found between age and the dental anxiety scores; it seemed that the increase in age was associated with a decrease in dental anxiety. In meta-analysis of 32 articles on dental behavior management problems, Klineberg et al., reported that children were expected to expe-

rience more anxiety than adolescents.<sup>19-21</sup> Findings in this study supported the work of Popescu et al. which reported that dental anxiety tends to decrease as children get older.<sup>8</sup> An equivalent study in Indian population reported that mean dental anxiety score reduces with increasing age.<sup>12</sup> Explanations proposed as to why dental anxiety might decrease with age include the ability to cope with experiences or the phenomenon may be due to the aging process itself characterized by a general decline in anxiety.<sup>14</sup>

Similar to other research findings,<sup>2</sup> this study found a statistically significant difference in dental anxiety between males and females, with females reporting higher levels of dental anxiety. An explanation for this may be that females report lower threshold and tolerance towards pain. Holtzman and colleagues found that women had more fear of specific stimuli such as injection or tooth drilling.<sup>3</sup> A number of previous studies in Norway also reported the same results for higher anxiety in females as compared to males. Similar results were also seen in the studies by Singh et al. that evaluated 200 children between the age group of 12 to 15 years old, whose results showed that the female population had higher anxiety scores than the males. Also, Macedo et al., Yildirim and White et al., reported higher levels of anxiety in females.<sup>16-18</sup>

The present study was also used to compare the levels of dental anxiety among school children of the two cities i.e. Abbottabad and Islamabad. Results suggested that the students of Abbottabad were moderately anxious (71%) as compared to the students of Islamabad who were found to be highly (42%) and severely anxious (36%). The results are in contrast to the findings of Al Madi and Abdellatif; which reported 54.4% moderate anxiety and 29% high anxiety.<sup>14</sup>

Mean level of dental anxiety was found to be correlated to different dental procedures that are used for treatment. Caltabiano et al. investigated the dental procedures that are anxiety provoking like tooth being drilled (26.1%) and local anesthetic being injected (24.6%), using the MDAS survey in adult population in Australia.<sup>12</sup> Our study in comparison had higher mean values when the patient thought of having their tooth drilled (26.4%) and local anesthetic injection (26.7%).

An additional question regarding tooth ex-

traction was added to MDAS set of questions because a significant proportion of the population views tooth extraction services as the first line and the desirable modality of treatment for toothaches.<sup>15</sup> Current study indicates that invasive stimuli like tooth extraction tend to be most anxiety provoking (23.7%) followed by tooth drilling and local anesthetic injection. This may be explained by the fact that invasive procedures are often associated with pain which has a vicious relation with anxiety.<sup>15</sup>

Studies and reflections on fear and anxiety can contribute to a significant improvement in dental appointments, using measures to increase patient's confidence in treatment and in the dentist, as presented in a study by Ulhoa et al. which aimed to minimize dental anxiety by identifying characteristics and stimuli that generate anxiety. Silva et al. also stated that identifying these conditions is a challenge for dentists. A good dialogue between the professional and the patient is also important in order to reduce stress, as observed in the study by Macedo et al. In children there is an additional challenge in the perception of fear, since these needs to be conditioned in the best possible way so they do not have negative experiences, as reported in a study by Merdad et al. Chaturvedi et al. conducted a research in the dental environment reporting the positive value of psychological techniques in the preparation of children during dental treatment.<sup>16, 18</sup>

According to the findings of Locker et al., the dental teams need to take as much care with child patients as with adults and use appropriate communication techniques which enhance trust and feelings of control.<sup>22</sup>

Present study is limited because of small sample size which can not be inference to general population. Therefore large population should be target to evaluate their dental anxiety level, at least in those population who have easy access to dental services.

## CONCLUSION

Prevalence of dental anxiety in this patient sample was found to be moderately high as compared to previous studies. Dental anxiety surveys such as MDAS are an easy and reliable way to assess dental anxiety so that care can be more patient centered and effective. Patients who suffer from dental anxiety are often more difficult to treat. Being aware of patient's

anxiety may contribute to the dental professionals' establishment of a trusting rapport and thus encourage routine care in an effort to help patients maintain an optimal oral health.

Interpersonal collaboration is always beneficial for the patient. If the dentists become more aware about the level of dental anxiety among their patients, they can anticipate patients' behavior and can be better prepared to take behavioral or pharmacological measures to reduce their anxiety levels.

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