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Assessing Dental Anxiety Among Children In A Dental Clinic Waiting Room: An Observational Study

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Abstract:
Background*: Dental anxiety among children can significantly impact their overall oral health and well-being. This study aims to assess the levels of dental anxiety among children age 7 to 12 in a dental clinic waiting room using the Modified Dental Anxiety Scale (MDAS). The aims of this observational study were to evaluate the impact of the dental waiting room and previous dental visits on dental anxiety among children aged 7 to 12 who were waiting for their treatment.*
Materials & Methodology: *A total of 234 children aged 7 to 12 years were included in the study, and their dental anxiety levels were assessed using the MDAS. The scale, comprising a questionnaire of five items related to dental anxiety, was administered to each participant in the dental clinic waiting room.*
Result : *Results shows Females exhibited a significantly higher median MDAS score compared to males and the extraction of tooth Procedure had a significantly higher MDAS score than those receiving restoration or scaling.*
Conclusion*: This observational study provides insights into the prevalence and factors associated with dental anxiety among children in a dental clinic waiting room. Understanding the levels of dental anxiety in this age group is crucial for developing targeted interventions and strategies to alleviate anxiety and promote positive dental experiences*

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I. Introduction

Dental anxiety (DA) is a significant challenge when treating patients, whether they are children or adults.[1] Adults can decide for themselves if they want to visit the dentist, but for children, it is the parents who make the decision.[2] This can result in a child visiting the dentist even if they do not want to. About 16% of school-age children are afraid of the dentist, which can lead to them avoiding dental care altogether.[3]

Several factors influence a person's level of dental anxiety, including the type of clinical procedure, personality traits, the environment, time spent in the waiting room, and gender.[4] While adult women often show more dental anxiety than men, studies have found no gender differences in dental anxiety among children.[5] Some research suggests that girls aged two to three years old appear more confident and are more likely to explore than boys.[6] However, boys are more likely than girls to let fear prevent them from visiting the dentist.[1]

Because anxiety and fear are subjective and can vary greatly, various scales have been developed to measure them. Dental anxiety has multiple components.[7] It is most commonly measured using questionnaires and rating scales. One widely used questionnaire is the Dental Anxiety Scale (DAS).[8] The Modified Dental Anxiety Scale (MDAS) is an updated version of the DAS, which includes an additional question about local anesthesia injection. The MDAS is considered the gold standard for measuring dental anxiety.[9]

The Aim of the present study was to evaluate dental anxiety among children in a waiting room of a dental clinic, prior to dental treatment, by using self-reported questionnaires.

II. Material And Methods

233 consecutive patients aged 7 to 12 who visited the Department of Pediatric and Preventive Dentistry at Rishiraj College of Dental Science and Research Centre were asked to fill out a two-part questionnaire while waiting in the waiting room. Each patient was accompanied by at least one parent. The age of seven was chosen as the starting point because, at this age, children typically have the reading and comprehension skills needed to understand the straightforward questions in the survey.

The first part of the questionnaire gathered sociodemographic details about the children, such as their age, gender, whether they had visited a dentist in the past 6-12 months or longer, any previous operative treatments, and their knowledge of the current treatment. For younger patients, parents assisted with answering questions related to their past dental visits and treatments.

The second section contained the Modified Dental Anxiety Scale (MDAS)(Fig A) which included five multiple-choice questions that assessed the child's reactions to various dental situations: (1) anticipating a visit to the dental clinic; (2) waiting in the dentist's office for treatment; (3) drilling of teeth; (4) scaling of teeth; and (5) receiving a local anaesthetic injection. Each question offered five possible answers, ranked from one to five, with a maximum score of five for each question and a total possible score of 25 for the entire scale.

When a patient had difficulty reading the questions in the second section, the clinician would read them aloud. The clinician ensured that the questions were read in a standardized manner for all patients who required assistance.

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Inclusion criteria:

- Children of 7 to 12 age group
- Parents who are willing to take up the survey
- Children who are in need of treatment
- who have Previous dental experience

Exclusion criteria:

1. Highly uncooperative patient
2. Child having any kind of systemic diseases
3. Children who are on regular medications
4. Parents who deny taking up the survey

Statistical analysis

Data were entered into the Excel sheet. Data were analyzed using SPSS (Statistical Package for Social Sciences) 25.0 version, IBM, Chicago. The data were analyzed for probability distribution using the Shapiro-Wilk test and data was not found to be normally distributed thus, a non-parametric test of significance was applied. Descriptive statistics were performed, and data was described as a median and inter-quartile range. The inter-group comparison was done using the Mann-Whitney U test and the Kruskal-Wallis test. P-value <.05 was considered statistically significant

III. Result

The study included 233 subjects with a focus on their age, gender, treatment undergone, and dental anxiety levels.

The first section includes details of prior dental visits as well as demographic information, such as age and gender. The study began by examining the history of dental visits among participants.

According to **Figure 1**, all subjects were returning patients, indicating that they had previously visited a dentist. The majority of these patients had visited the dentist within the past 12 months, accounting for 70% of the participants. The primary reasons for previous dental visits included examinations (45%) and routine restorations (46%)

The Distribution of study subjects based on age shows in **Figure 2**, that the majority of the study's subjects were younger than 12 years . Specifically, 67.4% of participants (157 subjects) fell into this younger age group. In contrast, the remaining 32.6% (76 subjects) were 12 years of age or older. This indicates that the study predominantly included younger children, highlighting a key demographic in pediatric dentistry.

Figure 3 illustrates the gender distribution of the study subjects, revealing a relatively balanced representation of male and female participants. Males made up a slightly larger portion of the sample, constituting 52.8% of the participants (123 individuals). Females accounted for 47.2% of the study population, with 110 participants. Although there was a small difference in gender distribution, both sexes were well represented, ensuring that the study's findings are reflective of both male and female dental health patterns.

The second section provides detailed results regarding the MADS score.

Modified Dental Anxiety Scale (MDAS) was used to measure dental anxiety among the children in the study. The overall median MDAS score was 11.0, with an interquartile range (IQR) of 9.0 to 14.0, indicating that the middle 50% of the participants had scores within this range.

Figure 4 shows Distribution of study subjects based on treatment undergone, the majority of the children underwent dental restoration, which was the most common treatment, received by 39.1% of the subjects (91 out of 233) following restoration, the second most common treatment was tooth extraction a significant 34.3% of the children (80 subjects) had one or more teeth extracted and lastly 26.6% of the subjects (62 children) underwent dental scaling. Although less common than restoration and extraction, scaling still represented a substantial portion of the treatments provided. Overall, the distribution of treatments shows that a diverse range of dental interventions was necessary among the children, with restoration being the most frequent, followed closely by extraction, and then scaling.

Figure 5 shows MDAS score between different genders, indicating When comparing anxiety levels between genders, females had significantly higher MDAS scores compared to males. The median MDAS score for females was 12.0 (IQR: 10.0-14.0), while for males, it was 10.0 (IQR: 9.0-13.0). This difference was statistically significant, with a p-value of less than .001, indicating that females generally experienced more dental anxiety than males.

Figure 6 shows MDAS score between different treatment groups ,where Children who had tooth extractions exhibited the highest median MDAS score of 12.0 (IQR: 10.0-15.0). This score was significantly higher than those of children who underwent either restoration or scaling. The median MDAS score for children who received restorative treatments was 11.0 (IQR: 9.0-13.0), while for those who had scaling, it was 10.0 (IQR: 8.0-13.0). The differences in anxiety scores between these treatments were statistically significant, with a p-value of .001.

A post hoc analysis further clarified these differences. The anxiety level among children who underwent extraction was significantly higher compared to those who had restorative treatments (p-value = .030) or scaling (p-value < .001). However, the difference in anxiety scores between children undergoing restoration and those undergoing scaling was not statistically significant (p-value = .062).

Overall, the findings indicate that dental anxiety was more pronounced among females and was highest in children who required tooth extractions, compared to those receiving restorative treatments or scaling.

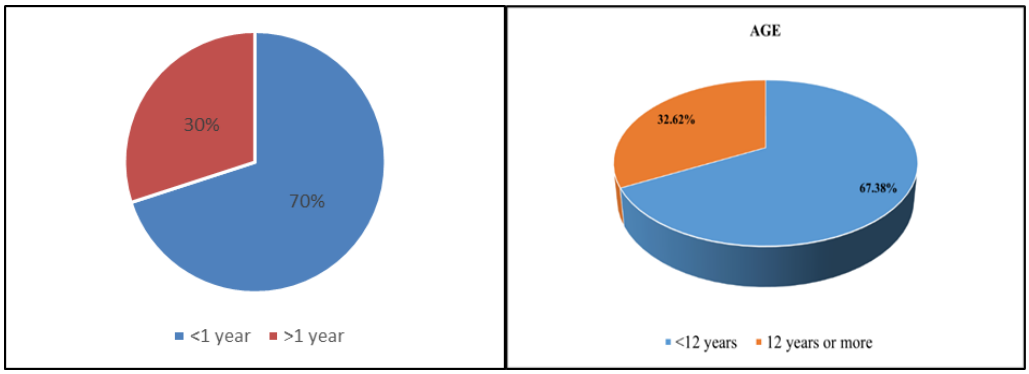


Figure 1 Information About Last And Present Visit
Figure 2: Distribution of study subjects based on age

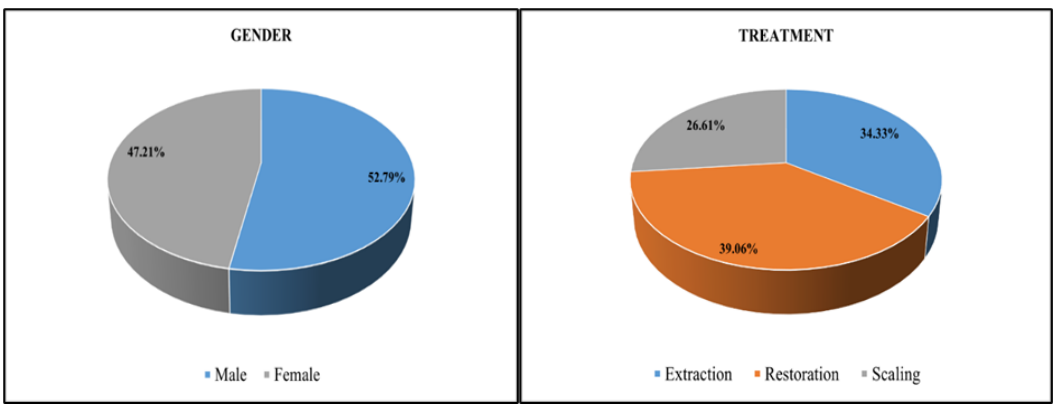


Figure 3: Distribution of study subjects based on gender
Figure 4: Distribution of study subjects based on treatment undergone

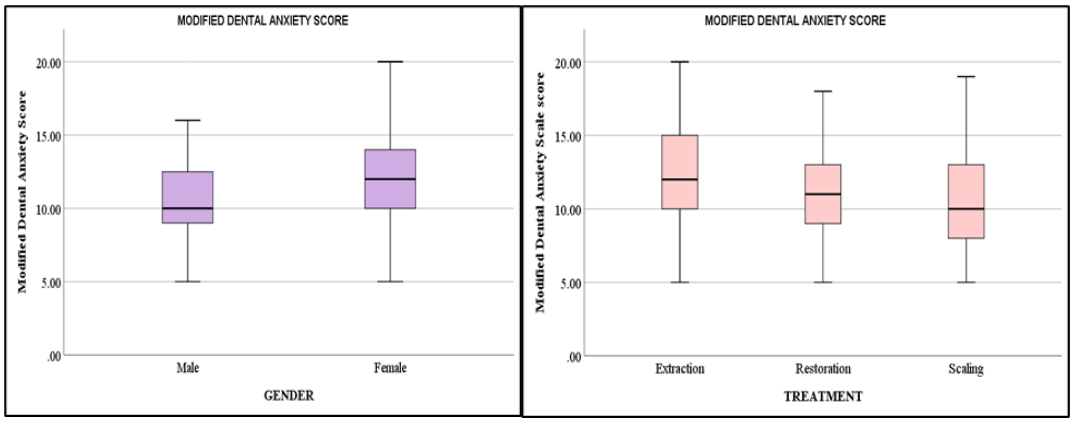


Figure 5. MDAS score between different genders
Figure 6. MDAS score between different treatment groups

IV. Discussion

Child anxiety in pediatric dentistry is a well-documented concern that can significantly impact a child's experience and the outcome of dental treatments. According to Klingberg and Broberg [10], dental anxiety is prevalent among children and adolescents, with various factors such as previous negative experiences and fear of pain playing crucial roles in its development. Arnrup et al.[11] further emphasize that this anxiety often manifests through behaviors like crying, physical resistance, or even avoidance of dental appointments. Effective management strategies, such as behavioral interventions and gradual exposure to dental procedures, are essential in addressing these anxieties and ensuring successful dental care. Additionally, Majstorović and Veerkamp [12] highlight that understanding the specific causes of a child's dental anxiety allows for more targeted and effective interventions, ultimately improving the overall dental experience for pediatric patients.

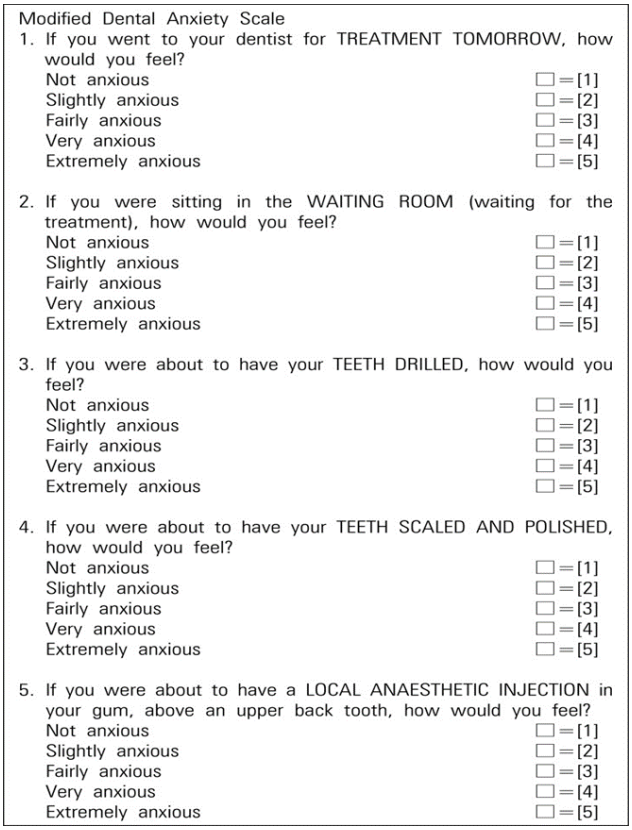
In our study majority of the patients had visited the dentist within the past 12 months, accounting for 70% of the participants. Avoiding dental visits for over a year before the current appointment was associated with higher levels of dental anxiety compared to visiting the dentist within a year of the current visit.[11] This suggests that regular dental visits may help reduce anxiety by keeping the idea of the visit fresh in the child's mind. Consequently, long gaps between appointments might lead to increased anxiety. However, it's also possible that these long intervals are a reflection of already high dental anxiety, which in turn causes the child to avoid dental appointments.[12]

In 1995, 26 years after the development of DAS, the MDAS was created by Humphris et al. from the United Kingdom (Fig.A)). MDAS differs from DAS in two main aspects.[23] Firstly, it includes an additional question that asks about the patient's feelings just before receiving a "local anesthetic injection," making five questions. Secondly, the content of the response options was changed to assess the degree of anxiety (not anxious(1), slightly anxious(2), fairly anxious(3), very anxious(4), extremely anxious(5)), applying the same response options for all questions, which is often seen as an improvement over the DAS, where different types of responses were used for each question, which is considered a weakness of DAS. The scores are calculated in the same manner as DAS, by summing up the responses, resulting in a distribution of 5 to 25 points. Higher scores indicate higher levels of anxiety.

Gender difference regarding dental anxiety may be because difference in psychopathology revealing that female are over presented in neurotic categories. [13]The difference could be due to conditioning responses. [14] Research has consistently shown that female pediatric patients tend to express higher levels of dental anxiety compared to their male counterparts. According to Broen and Borge [15], this gender difference may be attributed to social and psychological factors, where girls are often more open about their fears and emotions than boys. Muris and Lang [16]suggest that societal expectations and upbringing might encourage girls to be more expressive about their anxieties, including those related to dental visits. Additionally, Klingberg et al.[17] found that previous negative dental experiences tend to have a more profound impact on female patients, contributing to heightened anxiety levels. These findings indicate that gender-specific approaches might be necessary to effectively manage dental anxiety in pediatric patients. On the contrary, certain other studies reported that there were no differences between both genders regarding dental anxiety.[21] In contrast, it has been reported that dental anxiety is more prevalent in boys.[22] The children who had no siblings were comparatively more anxious than the ones who had an elder sibling being as role models for them. This is in concordance with a study by Aminabedi NA *et al.*[18] When stating about the socioeconomic status of each child, there is no significance with the anxiety levels in children.

Another parameter to be considered is the type of treatment and the way it is being performed on the child: 39% underwent restorative treatment , 34% had undergone extraction with high MDAS score of 12.0 and

26% had oral prophylaxis individually. According to a study, higher anxiety levels were noticed in children while performing an extraction due to the use of needles and while injecting. This being a painful procedure makes the child uncooperative. It was reported that local anesthesia injections increase the dental anxiety scores and the lowest score was linked to oral prophylaxis[19].



Modified Dental Anxiety Scale

1. If you went to your dentist for TREATMENT TOMORROW, how would you feel?
   - Not anxious ☐=[1]
   - Slightly anxious ☐=[2]
   - Fairly anxious ☐=[3]
   - Very anxious ☐=[4]
   - Extremely anxious ☐=[5]
2. If you were sitting in the WAITING ROOM (waiting for the treatment), how would you feel?
   - Not anxious ☐=[1]
   - Slightly anxious ☐=[2]
   - Fairly anxious ☐=[3]
   - Very anxious ☐=[4]
   - Extremely anxious ☐=[5]
3. If you were about to have your TEETH DRILLED, how would you feel?
   - Not anxious ☐=[1]
   - Slightly anxious ☐=[2]
   - Fairly anxious ☐=[3]
   - Very anxious ☐=[4]
   - Extremely anxious ☐=[5]
4. If you were about to have your TEETH SCALED AND POLISHED, how would you feel?
   - Not anxious ☐=[1]
   - Slightly anxious ☐=[2]
   - Fairly anxious ☐=[3]
   - Very anxious ☐=[4]
   - Extremely anxious ☐=[5]
5. If you were about to have a LOCAL ANAESTHETIC INJECTION in your gum, above an upper back tooth, how would you feel?
   - Not anxious ☐=[1]
   - Slightly anxious ☐=[2]
   - Fairly anxious ☐=[3]
   - Very anxious ☐=[4]
   - Extremely anxious ☐=[5]

Fig A- MDAS

V. Conclusion

This observational study provides insights into the prevalence and factors associated with dental anxiety among children in a dental clinic waiting room. Understanding the levels of dental anxiety in this age group is crucial for developing targeted interventions and strategies to alleviate anxiety and promote positive dental experiences. More further studies are required evaluating dental anxiety among children considering other clinical parameter like Pulp therapy, crown or spacemaintainer placement etc.

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