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# Assessment of Anxiety and Treatment Seeking Behaviour among Adults Attending Dental Out-Patient Department in Nepal: A Cross-Sectional Study

**Ravi Raj Timasina**[1*] **Prajwal Shrestha**[2] **Shambhu Upadhyay**[3] **Bipin Karki**[4]

[1]Department of Radilogy & Mental Health, Gandaki Medical College Teaching Hospital & Research Centre, Pokhara, Nepal.

[2]Department of Dentistry, Kathmandu Model Hospital, Kathmandu, Nepal.

[3]Public Health Concern Trust, Kirtipur, Nepal.

[4]Department of Anesthesia & Critical Care, Pokhara Academy of Health Sciences, Pokhara, Nepal.

## ABSTRACT

**Background**

Dental anxiety is a significant barrier to accessing regular dental care, frequently leading to delayed treatment and the progression of oral diseases. This study aimed to assess the levels of dental and general anxiety and to evaluate their impact on dental treatment-seeking behavior among adult patients in Nepal.

**Methods**

A cross-sectional study was conducted From December 2022 and July 2023 among 359 patients aged over 16 years attending the dental outpatient department at Kathmandu Model Hospital. Data was collected using a self-reported proforma that included the validated Nepali translations of the Modified Dental Anxiety Scale (MDAS-N) and the Beck Anxiety Inventory (BAI).

**Results**

The mean MDAS score was 11.09, indicating a moderate level of dental anxiety, while the mean BAI score was 26.4. The results showed a statistically significant moderate positive correlation between dental anxiety and general anxiety ($\rho = 0.425$, $p < 0.001$). Females exhibited significantly higher levels of both dental and general anxiety compared to males ($p < 0.001$). Additionally, the duration of delay in seeking treatment was found to be significantly dependent on both dental anxiety ($p = 0.006$) and general anxiety ($p = 0.013$).

**Conclusions**

Moderate dental anxiety is prevalent among dental patients in Nepal and is closely tied to generalized anxiety. This fear disproportionately affects women and directly drives patients to delay necessary care. Integrating brief anxiety screenings into routine dental visits could help practitioners identify and address these psychological barriers.

**Key Words**: Clinical anxiety; Dental anxiety; Treatment seeking behaviour; LMIC; MDAS-N.

***Correspondence:** Dr. Ravi Raj Timasina, Department of Psychiatry & Mental Health, Gandaki Medical College Teaching Hospital & Research Centre, Pokhara, Nepal. E-mail: drtimasina@gmail.com, Phone no: +9779802824655.
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## INTRODUCTION

Anxiety is one of the most common psychiatric disorders in the general population and is associated with impairment in considerable percentage[1, 2] Anxiety related to dental procedures often leads to delayed or avoided dental visits, resulting in the progression of oral diseases that could otherwise be managed easily and cost-effectively at an earlier stage.[3] Anxiety a commonly encountered condition in medical practice significantly influences patients' health-seeking behavior.[4] The etiology of dental anxiety is multifactorial including patient related factors, traumatic dental experiences, operator related factors among some. Anxious patients tend to postpone or completely avoid dental treatment, contributing to dental neglect and increased treatment complexity. Although pharmacological and behavioral approaches have been employed to manage dental anxiety, these interventions may further increase treatment cost and complexity.[5,6] Dental anxiety has also been shown to mediate the relationship between perceived treatment need and prolonged intervals between dental visits, highlighting its role as a major barrier to accessing dental care.[7]

This study aims to assess dental and general anxiety levels among adult patients attending Kathmandu Model Hospital to evaluate the impact of anxiety in dental treatment-seeking behavior.

## METHODS

**Study Area**

This study was conducted among patients attending the Dental Out-Patient Department (OPD) of Kathmandu Model Hospital, Kathmandu, Nepal.

**Study Design**

This was a cross-sectional study.

**Sample size and sampling**

The study included patients aged 16 years and above attending the Dental OPD during the study period. Patients were excluded if they: (i) declined to provide consent, (ii) had a previous diagnosis of any anxiety disorder, or (iii) had visited the dental OPD within the preceding year. The sample size was calculated assuming a prevalence of dental anxiety of 34%, a 95% confidence level, and a 5% margin of error, resulting in a required sample size of 343. After accounting for a 5% attrition rate, a total sample size of 359 participants was included in the study. Eligible participants were recruited consecutively until the required sample size was achieved.

**Data Collection**

The study was carried out between December 2022 and July 2023. Ethical approval was obtained from the Institutional Review Committee, Kathmandu Model Hospital prior to data collection (Ref. No. 099-2022). Data were collected using a self-administered structured proforma consisting of three sections. The first section captured sociodemographic information. The second section included a semi-structured questionnaire assessing treatment-seeking behavior. The third section comprised two validated anxiety assessment tools. Dental anxiety was measured using the Nepali version of the Modified Dental Anxiety Scale (MDAS-N), a validated 5-item Likert scale with scores ranging from 5 to 25, where higher scores indicate greater dental anxiety. General anxiety was assessed using the Nepali version of the Beck Anxiety Inventory (BAI), a validated 21-item questionnaire with total scores ranging from 0 to 63, with higher scores indicating more severe anxiety symptoms.

**Data Analysis**

After data collection was complete, the data was entered in a password protected computer. Descriptive statistics were used to summarize participant characteristics. Mean and median with their standard deviations(SD) were used based on the distribution of the data. Descriptive statistics were utilized to summarize the data; continuous variables were expressed as means, standard deviations (SD), and medians based on their distribution. Pearson's correlation coefficient was used to assess the linear relationship between MDAS-N and BAI total scores. To evaluate the strength and direction of the associations between continuous variables, Spearman's rank correlation coefficient was used. For comparisons of dental anxiety scores across

different degrees of delay in presentation times, the Kruskal-Wallis H and U tests were employed. All statistical tests were two-tailed, and the threshold for statistical significance was set at $p < 0.05$. Statistical Package for Social Sciences (SPSS, version 24) was used for all statistical analysis.

## RESULTS

Baseline characteristics and health seeking behaviours:

The participants age ranged from 16 to 77 years (mean 30.1 years, SD ± 12.4 years). The sample comprised more females 208(57.94%), married individuals 201(55.99%) and students 171(47.63%). Half of the respondents 182(50.70%) reported a monthly family income exceeding NRs 45,751. Around 72.7% of patients had sought dental care either immediately 36(10.03%) or within one week of symptom onset 225(62.67%). The rest 98(27.3%) had sought care after a week of onset of symptoms out of which a significant 29(8.08%) of these patients had sought care after 6 months of onset of symptoms. A two third 241(67.13%) of the patients had received some form of treatment from drug stores. Other sources of treatment were ayurveda 16(4.46%), homeopathy 9(2.51%) and faith healers 8(2.23%) while 85(23.68%) did not receive any treatment at all. The detailed baseline characteristics are shown in Table 1.

**Table 1: Sociodemographic Profile of Participants (n=359).**

| Characteristics | Frequency n (%) |
|---|---|
| **Sex** | |
| Female | 208 (57.94) |
| Male | 151 (42.06) |
| **Age Group (years)** | |
| 16-25 | 175 (55.6) |
| 26-40 | 85 (27.0) |
| >40 | 55 (17.4) |
| **Marital status** | |
| Married | 201 (56) |
| Single | 158 (44) |
| **Education** | |
| SLC & Below | 146 (40.6) |
| Higher Secondary | 43 (12) |
| Bachelor's & Above | 170 (47.4) |
| **Primary Occupation** | |
| Student | 171 (47.6) |
| Employed (Service/Business) | 128 (35.6) |
| Homemaker/Unemployed/Other | 60 (16.8) |
| **Family Income (Monthly)** | |
| ≥NRs 45,751 | 182 (50.8) |
| NRs 22,851-45,750 | 84 (23.4) |
| NRs 17,151- 22,850 | 35 (9.7) |
| NRs 11,451- 17,150 | 9 (2.5) |
| NRs 6,851-11,450 | 19 (5.3) |
| NRs 2,301- 6,850 | 7 (1.9) |
| ≤ NRs 2,300 | 23 (6.4) |
| **Treatment sought after problem started** | |
| Immediately | 36 (10) |
| Within one week | 225 (62.7) |
| Within 1 week to 1 month | 62 (17.3) |
| 1 month to 6 months | 7 (1.9) |
| After 6 months | 29 (8.1) |
| **Treatment sought from** | |
| Ayurvedic | 16 (4.5) |
| Drug Store | 241 (67.1) |
| Faith Healer | 8 (2.2) |
| Homeopathy | 9 (2.5) |
| None | 85 (23.7) |

**Anxiety scores:** The average Modified Dental Anxiety Score- Nepali (MDAS-N) score was 11.09, that is moderate anxiety. Low level or no anxiety was present in 31.5% patients. Half of the patients, 50.1% had moderate anxiety while high anxiety was seen in 15.9% patients and severe anxiety was present in 9 patients which accounts for 2.5% of the patients.

The average Beck Anxiety Inventory (BAI) score was 5.43 (SD ± 6.89). Almost two third (73.26%) of the patients were found to have minimal anxiety, rest were followed by mild, moderate and severe anxiety ( 16.16%, 8.36% and 2.23%) respectively. (Table 2).

**Table 2: Distribution of Dental (MDAS) and General (BAI) Anxiety Severity (n=359).**

| Severity Category | Score Range | Frequency n (%) |
|---|---|---|
| **MDAS-N** | | |
| Low/ Not Anxious | 5-9 | 113 (31.48) |

| | | |
|---|---|---|
| Moderate Anxiety | 10-14 | 180 (50.14) |
| High Anxiety | 15-18 | 57 (15.88) |
| Severe Anxiety | 19 and above | 9 (2.51) |
| **BAI** | | |
| Minimal | 0-7 | 263 (73.3) |
| Mild | 8-15 | 58 (16.2) |
| Moderate | 16-25 | 30 (8.4) |
| Severe | 26-63 | 8 (2.2) |

Association of dental anxiety to clinical anxiety: There is a statistically significant, moderate positive correlation between MDAS-N and BAI scores. This means that as an individual's dental anxiety increases, their general anxiety tends to increase as well. The Spearman rank correlation ρ of 0.435 indicates that this rank-order relationship is quite robust. MDAS-N scores across standard tiers, Low/ no 5-9, Mod 10-14, High 15-18 and Severe/ Phobia > 19.

The differences in general anxiety across these groups are highly significant. Individuals with severe dental anxiety average have a substantially higher general anxiety score (11.11 ± 10.04) compared to those with low dental anxiety (3.15± 5.26).

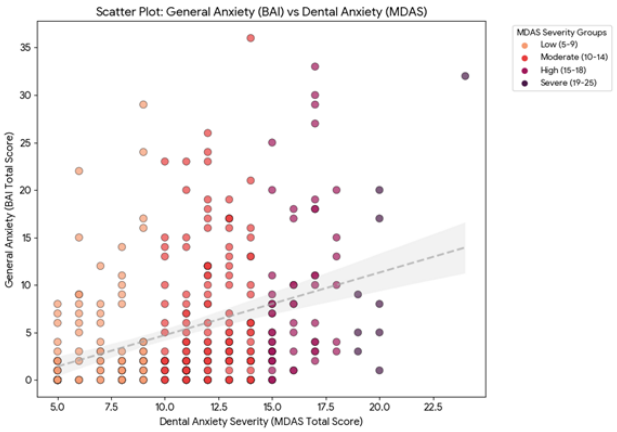


**Figure 1: Scatter plot of MDAS-N and BAI scores of individual patients (n=359).**

X Axis is MDAS-N scores and the Y Axis consists of BAI scores. The solid line represents the association between the two scores with 95% confidence interval in the shaded area.

Gender association among Dental anxiety and general anxiety scores: To evaluate if anxiety scores differ significantly between males and females, a Mann-Whitney U Test was performed. Females exhibited higher dental anxiety than males. The average MDAS-N score for females is 11.96, compared to 9.89 for males since $p<0.001$, is statistically significant. Females also experience significantly higher levels of general anxiety than males. The average BAI score for females is 6.86, whereas for males it is 3.48. $p<0.001$, this difference is statistically significant.

**Age correlations :** Age has no significant impact on dental anxiety. Whether a patient is younger or older does not reliably predict their fear of dental procedures. There is a statistically significant negative correlation between age and general anxiety. As age increases, general anxiety (BAI scores) tends to gradually decrease $r=-0.28$ $p< 0.001$. While the correlation is relatively weak-to-moderate r -0.28, the remarkably low p-value confirms that this inverse relationship, is a genuine observable trend in the population rather than random chance.

**Treatment seeking behaviour relationships :** Non-parametric Kruskal-Wallis H tests were conducted to investigate whether dental anxiety and general anxiety scores differ systematically depending on where individuals sought treatment. H = 9.3084 p-value :0.0538. Although the p value (0.0538) slightly exceeds the typical significance threshold of 0.05, there is a noticeable trend showing higher average dental anxiety scores among those utilizing traditional/alternative systems like Ayurvedic and Faith Healer treatments (μ = 13.25 each) compared to those using Homeopathy (μ = 9.44).

Based on the total scores in MDAS-N patients seeking ayurvedic treatment had μ 13.25 ± 4.27, faith healer μ 13.25 ± 2.71, drug store μ 11.15 ± 3.53, none μ 10.459 ± 4.45 and homeopathy μ 9.44 ± 4.48. demonstrating a noticeable trend showing higher average dental anxiety scores among those using traditional systems. While individuals preferring Ayurvedic options had the highest average general anxiety (μ = 8.62), whereas those seeking care from a Faith Healer had the lowest average scores (μ = 3.50) with remarkably low variability (σ = 0.93). On the difference in BAI scores across these treatment sources is statistically significant on Kruskal-Wallis p-value 0.0118, no statistically significant relationship between gender and the selected treatment source was found. Both female

and male participants show a highly comparable pattern of utilizing these options.

To find the relationship of delay in seeking treatment and anxiety, Spearman's correlation was used. Both MDAS-N and BAI showed no significant linear association with delay in treatment seeking. Kruskal-Wallis test was used next which demonstrated a statistically significant relationship between MDAS-N and delay in treatment seeking. Similarly, BAI was also found to be significantly associated with delay in treatment seeking.

## DISCUSSION

This cross sectional study examined dental anxiety levels, general anxiety, health seeking behaviours and their inter relationships among patients attending dental out-patient department. The mean score of Modified Dental Anxiety Scale- Nepali (MDAS-N) was 11.09, indicating a moderate level of dental anxiety among the study population, which is consistent with the findings from regional and international studies. The mean Becks Anxiety Inventory (BAI) score of 11.11 reflects a low degree of clinical anxiety in the study population. The finding, a statistically significant positive moderate correlation between dental anxiety and general anxiety (Spearman correlation coefficient, $\rho = 0.435$, $p < 0.001$). Associations were also seen between anxiety and patterns of treatment-seeking behaviour which offers important insights for clinical dental practice and public health planning in Nepal.

The mean MDAS-N score of 11.09 observed similar values reported from the study by *Shrestha et. al.,* (MDAS-N= 12.63) by *Poudel SS et al.,* [10] suggesting a moderate anxiety burden in this population. It aligns with a broader cross-national comparison showing that moderate levels of dental anxiety with mean MDAS scores in the range of 9 to 13 are characteristic of Asian and South Asian dental clinic populations, including those from India (9.68), Japan (10.89), and Nepal (12.29), as summarized by Hmud and Walsh (2009). [11] The proportion of patients with high or severe dental anxiety (18.4% combined) in the present study falls within the internationally reported range of 5-20% for clinically significant dental anxiety, and is comparable to prior Nepali estimates of 9.19 - 9.8% for the highest severity category (MDAS ≥ 19), with the severe category (2.51%) consistent with the 2% reported at BPKIHS, Dharan by *Giri et al.,*[8] Importantly, 2.5% of participants met criteria suggestive of extreme dental fear or dental phobia similar to the distribution in the study done in a similar setting by *Kumal et. al.,*[12] This prevalence is remarkably consistent with a recent systematic review and meta-analysis involving 72,577 adults worldwide, which estimated the global prevalence of severe dental fear at 3.3%, while high dental anxiety affected approximately 12.4% of adults. [13] The same review further demonstrated that dental anxiety is consistently more prevalent among women and younger adults, demographic patterns that closely resemble those observed in the present study.

This study used both the MDAS-N and the Beck Anxiety Inventory (BAI) to simultaneously assess dental and general anxiety in the same population. The statistically significant positive correlation (Spearman $\rho = 0.425$, $p < 0.001$) and the highly significant Kruskal-Wallis test ($H = 38.06$, $p < 0.001$) demonstrating progressively higher BAI scores across MDAS-N from a mean BAI of 5.43 in the low dental anxiety group to 11.11 in the severe dental anxiety group strongly support the hypothesis that dental anxiety is not an isolated phenomenon but is embedded within a broader anxious character. We observed female patients reported significantly higher levels of anxiety compared to males, in both MDAS-N and BAI scores. MDAS-N 11.96 vs 9.89 and BAI 6.86 vs 3.48 in females and males respectively. The gender disparity is well established in the literature and is attributed to a complex inter play of biological, emotional and social factors. [14–16] Age showed no significant correlation with dental anxiety as also demonstrated by other researchers. [17] We noted a significant negative correlation between age and general anxiety. General anxiety levels decline predictably as age increases, however stimulus specific dental fear is age-invariant persisting regardless of age.[18]

Another notable finding was the widespread reliance on self-management and alternative healthcare pathways prior to seeking professional dental care. Approximately two-thirds (67%) of participants initially visited drug stores for symptomatic relief, while others sought care through Ayurveda (4.5%), homeopathy (2.5%), or faith healers(2.2%) while almost one fourth (23.7%) received no intervention at all. Similar patterns have been documented in low- and middle-income countries where barriers such as fear, treatment costs, accessibility concerns, and cultural beliefs influence healthcare decisions. [19] The influence of anxiety on healthcare-seeking behavior was evident in the present study, 62% sought dental treatment after a week, 17.3% delayed it for about a month, with approximately 8% postponing consultation for more than six months. These findings support the well-established Berggren's "vicious cycle of dental fear" model proposed in the literature. According to this framework, anxious individuals avoid routine dental care, resulting in deterioration of oral health and progression of disease. When treatment eventually becomes unavoidable, patients often require more invasive and painful procedures, which further reinforce existing fears and perpetuate future avoidance behaviors. This cycle has been consistently observed across multiple international studies and remains one of the most widely accepted explanations for the relationship between dental anxiety and poor oral health outcomes. [20] When investigating relationship between anxiety and treatment seeking duration, the data presents a non-linear dynamic, the Spearman's correlation showed only a weak positive link with dental anxiety ($\rho$ 0.078, $p < 0.005$) and no statistical significant relation with generalized anxiety. However, the data exhibits an inverted U-shaped pattern, a Kruskal-Wallis test was applied to evaluate the variance of anxiety levels across the different delay categories (ranging from "immediately" to "greater than 6 months"). This test definitively confirmed that the duration of treatment delay is significantly dependent on both dental anxiety ($p = 0.006$) and general anxiety ($p = 0.013$). This validates the clinical observation that severe anxiety fundamentally disrupts normal treatment-seeking behavior, causing significant and erratic delays rather than a straightforward, linear postponement.

Based on the available anxiety scores we have hypothesized the following classes of patients:

**Immediate/ Indefinite Presenters:** These group of patients reveal the lowest mean BAI scores 4.00 and 5.10 with mean MDAS-N scores of 10.22 and 8.83 respectively. These consisted of individuals who presented to the dental facility immediately or after 6 months of having dental problems.

**Anxious Avoiders:** These group of patients reveal the highest mean BAI scores 7.73 and mean MDAS-N score of 12.53. These consisted of individuals who presented to the dental facility around one month. The compounding anxiety cause them to avoid the dentist and not rush in. Instead, it drives a specific avoidance behavior where they delay treatment for a moderate window until acute symptoms or the clinical anxiety of avoiding treatment and getting a bigger disease finally override their psychological barriers. While such approaches in treatment delay may temporarily alleviate anxiety symptoms, they often fail to address the underlying pathology, allowing disease progression and increasing the likelihood of emergency presentations and complex interventions.

## Limitations

Several limitations should be considered when interpreting these findings. Because the study used a cross-sectional design, it cannot determine cause and effect relationships, particularly between general anxiety, dental anxiety, and treatment delay. The hospital based sample may also not fully represent the wider community, as individuals who seek dental care could differ from those who avoid it altogether, potentially leading to an underestimation of the true burden of dental anxiety in the population. In addition, relying on self-reported information may introduce recall and social desirability biases. Finally, the small number of participants in certain treatment subgroups, such as faith healers (n = 8)

and homeopathy users (n = 9), limits the statistical power and reduces the extent to which these subgroup findings can be generalized.

## Conclusions

Our findings show that moderate dental anxiety is a widespread reality for many patients in Nepal. This fear does not exist in isolation it is closely tied to generalized anxiety, affects women more frequently, and directly causes patients to delay the care they need. To break this cycle, routine dental visits should ideally include brief anxiety screenings. Practitioners can make a significant difference by prioritizing empathetic communication and understanding the real psychological and social barriers that keep people out of the dental chair. Moving forward, long-term community studies will be essential to trace the root causes of these fears. This will help design public health initiatives that encourage timely care and ultimately improve oral health outcomes.

**Ethics approval:** Ethical approval was obtained from the Institutional Review Committee, Kathmandu Model Hospital prior to data collection (Ref. No. 099-2022).

**Conflict of interest:** The author declares no conflict of interest.

**Funding:** No funding was received from any agency for conducting this study.

**Availability of data and materials:** All data analysed during this study will be made available upon reasonable request from the corresponding author.

## Author contributions

**Conceptualization:** Ravi Raj Timasina, Prajwal Shrestha
**Data curation:** Prajwal Shrestha
**Formal analysis:** Ravi Raj Timasina, Shambhu Upadhyay, Bipin Karki
**Investigation:** Ravi Raj Timasina, Prajwal Shrestha
**Methodology:** Ravi Raj Timasina, Prajwal Shrestha
**Supervision:** Shambhu Upadhyay, Bipin Karki
**Writing-original draft:** Ravi Raj Timasina, Prajwal Shrestha, Shambhu Upadhyay, Bipin Karki
**Writing-review & editing:** Shambhu Upadhyay, Bipin Karki

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