

A Public Health Perspective on Socio-Demographic Determinants of Dental Anxiety

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ABSTRACT

Objective: To determine the frequency of dental anxiety and its associated factors in dental outpatients at a private tertiary care hospital of Karachi.

Methods: A cross-sectional study was conducted at Baqai Institute of Health Sciences, Baqai Medical University, Karachi, from February, 2023 to December, 2024 with data collection performed at the dental outpatient department of a private tertiary care hospital of Karachi. A total of 767 participants aged 18 years or above were included in the study. The study questionnaire comprised of Modified Dental Anxiety Scale (MDAS) to assess dental anxiety. Data were analyzed on SPSS version 20.

Results: The mean age of the respondents was 34.74±12.63 years and 401 (52.3%) of them were females. The study results showed that 223 (29.1%) of participants were suffering from dental anxiety. Moreover, their gender, education, occupation and monthly household income were all significantly associated with their dental anxiety level ($p < 0.05$ for all).

Conclusion: It was concluded that a little less than third of the respondents were suffering from dental anxiety. Moreover, gender, education, occupation and monthly household income of the respondents were all significantly associated with their level of dental anxiety.

Keywords: Risk Factors, Dental Anxiety, Outpatients.

Received: 11-08-25

Accepted: 13-10-25

Published: 25-10-25

INTRODUCTION

Dental anxiety is defined as fear, anxiety or stress associated with dental setting.¹ Dental anxiety is a serious public health issue faced by many dental patients. This may be caused by the lack of knowledge about treatment procedures, due to poor experience from the past, or because of stories heard from friends or relatives. A recent systematic review and meta-analysis reported an overall pooled dental anxiety prevalence of 13.3% (95% CI 9.5, 17.0) in adolescents globally.² Another recent systematic review and meta-analysis reported the

global estimated prevalence of dental fear and anxiety to be 13.8%.³ Intriguingly, the locally estimates from Pakistan are even higher. A recent local study reported 22% of patients to have high dental anxiety whereas 38% of patients to have severe dental anxiety.⁴ Another recent local study reported 19 % of participants to have a high level of dental phobia whereas 67% of participants to have severe level of dental phobia.⁵ It is a well-known fact that a fearful person is more difficult to treat. Dental anxiety remains a serious cause of concern for both the dental practitioner and the patient

for provision of routine dental care. Despite of recent advances in dental technologies and treatment, fearful and anxious patients report experiences of pain and fear of specific dental procedures such as injections, drilling, extractions or root canal treatment.

There are several patient factors that may enhance dental anxiety in an individual. A recent review reported that both internal factors, such as genetic predispositions and central nervous system dysfunctions, and external factors, such as personal experiences, negative past dental encounters, environmental stimuli, temperament and coping mechanisms contribute to the development of dental anxiety.⁶ According to recent literature, some of the demographic factors implicated in Pakistani population include age, gender, education level and socio-economic status.^{4, 5, 7-12} Patients with higher dental anxiety and phobia are more likely to avoid dental treatment, resulting in poorer oral health and associated quality of life.¹³

To the best of authors' knowledge, recent local literature exploring dental anxiety and its associated factors in dental patients is limited at best. In the given context, this study was conducted to determine the frequency of dental anxiety and its associated factors in dental outpatients at a private tertiary care hospital of Karachi. The findings of this study are expected to meaningfully contribute to the limited local data available for generation of evidence based policies in order to effectively deal with this important public health issue in Pakistan.

PATIENTS AND METHODS

After obtaining ethical approval (Ref No.: FHM 30-2023), a cross-sectional study was conducted at Baqai Institute of Health Sciences, Baqai Medical University, Karachi from February, 2023 to December, 2024 with data collection performed at the dental outpatient department of a private tertiary care hospital of Karachi. Patients aged 18 years or above of either gender were included in the study whereas those undergoing any psychiatric therapy or diagnosed with generalized anxiety disorder were excluded from the study.

Keeping the percentage frequency of the study outcome at 50% for most liberal estimate, with 95% confidence level and 4% precision, the required sample size was calculated to be 601 participants by using the Openepi online calculator.¹⁴ Against the calculated sample size, a total of 767 patients were approached using non-probability convenience sampling technique.

The data were collected by the principal investigator after taking verbal informed consent from all participants. The study questionnaire comprised of two sections: Section A contained questions related to socio-demographic detail of the respondents whereas Section B comprised of the Modified Dental Anxiety Scale.¹⁵

The modified dental anxiety scale consists of 5 items. The response set is a 5 point like scale ranging from not anxious = 1 and extremely anxious = 5. The items summed together to produce a total score ranging from 5 to 25.¹⁶ A higher total score indicates greater dental anxiety, with a score of 19 or higher generally considered to suggest a strong likelihood of dental phobia.

Data analysis was done on SPSS software version 20. Frequencies and percentages were calculated for categorical variables while means and standard deviations were generated for continuous variables. Inferential analysis was performed by applying chi-square test whereas the significance level was kept at 0.05.

RESULTS

The mean age of the respondents was 34.74±12.63 years, 401 (52.3%) of them were females, 450 (58.7%) were married, 348 (45.5%) were either graduate or had diploma while 246 (32.1%) completed secondary education, 423 (55.1%) were employed, 306 (39.9%) had between 30,000 to 100,000 rupees whereas 239 (31.2%) had between 100,000 to 200,000 rupees monthly household income (table 1).

Table 1: Participants Profile

Participant characteristics (n=767)	Count (%)/Mean±S.D.
Age (years)	34.74±12.63
Age Group	
Up to 30 year	345 (45.0)
31 to 45 years	280 (36.5)
46 years or above	142 (18.5)
Gender	
Male	366 (47.7)
Female	401 (52.3)
Marital Status	
Married	450 (58.7)
Unmarried	317 (41.3)
Education Level	
Uneducated	78 (10.2)
Primary	95 (12.5)
Secondary	246 (32.1)
Graduate/Diploma	348 (45.4)
Occupation	
Employed	423 (55.1)
Unemployed	276 (36.0)
Student	22 (2.9)
Retired	46 (6.0)
Monthly Household Income (Rs.)	
Less than 30,000	107 (14.0)
30,000 to 100,000	306 (39.9)
100,000 to 200,000	239 (31.2)
200000 or Above	115(15.0)

Moreover, it was seen that 223 (29.1%) patients were suffering from dental anxiety (figure 1).



Figure 1: Level of Dental Anxiety

The bivariate analysis of association between participant characteristic and their dental anxiety level showed that gender ($p < 0.001$), education ($p < 0.001$), occupation ($p < 0.001$) and monthly household income ($p < 0.001$) were all significantly associated with dental anxiety where patients who were females, were graduates or had diploma, were unemployed or had monthly household income above 200,000 rupees were more likely to develop phobia than others (table 2).

Table 2: Bivariate analysis of association between Participant Characteristic and their Dental Anxiety Level.

Participant Characteristic (n= 767)	Dental Anxiety Level		p
	Normal n (%)	Phobia n (%)	
Age Groups			
Up to 30 years	235 (68.9)	106 (31.1)	0.207
31 to 45 years	194 (69.8)	84 (30.2)	
46 years or above	109 (76.8)	33 (23.2)	
Gender			
Male	289 (80.3)	71 (19.7)	<0.001
Female	249 (62.1)	152 (37.9)	
Education Level			
Uneducated	57 (73.1)	21 (26.9)	<0.001
Primary	82 (86.3)	13 (13.7)	
Secondary	179 (74.0)	63 (26.0)	
Graduation/Diploma	220 (63.6)	126 (36.4)	
Occupation			
Employed	319 (76.5)	98 (23.5)	<0.001
Unemployed	166 (60.1)	110 (39.9)	
Student	16 (72.7)	6 (27.3)	
Retired	37 (80.4)	9 (19.6)	
Marital Status			

Married	316 (70.5)	29.5 (17.3)	0.900
Unmarried	222 (70.9)	91 (29.1)	
Monthly Household Income (Rs.)			
Less than 30,000	70 (65.4)	37 (34.6)	<0.001
30,000 to 100,000	242 (80.7)	58 (19.3)	
100,000 to 200,000	162 (67.8)	77 (32.2)	
200,000 or Above	64 (55.7)	51 (44.3)	

DISCUSSION

This study is an attempt to explore the socio-demographic context of dental anxiety in our local population from a public health perspective. The study results showed the prevalence of dental anxiety to be 29.1% among the respondents, a percentage that is lower than previous local estimates.^{4, 5, 17} Several factors may contribute towards the development of dental anxiety in patients such as no prior experience of dental procedure, a traumatic past dental treatment experience, low pain threshold or a general fear of doctors. These factors may vary from one individual to another and from one population to other.

The study results did not show age to be significantly associated with dental anxiety level in the patients. Likewise, Siddiqi KM et al., in 2023⁷, Butt H et al., in 2021⁹ and Rizvi SZR et al., in 2019¹⁸ did not find age to be significantly associated with dental anxiety. Fear of dental procedure may stem at any age depending upon individual perceptions and past experiences that may not necessarily be age related.

The study results further showed a significant association between gender and dental anxiety level where female patients were more likely to develop dental anxiety than male patients. This finding is well in line with most of the published local literature^{4, 5, 7-9, 11, 12, 19}, though Mariam R et al., in 2025 reported dissimilar findings.²⁰ Such results were not unexpected as generally females may have a lower pain threshold and thus may have a higher perceived threat of discomfort during a dental procedure.

Interestingly, a significant association between education level and dental anxiety level was found in this study where patients who had completed graduation or had any diploma were most likely to develop dental anxiety. Literature reports varied findings in this regard. In line with the study results, Muneer MU et al., in 2022 and Siraj HA et al., in 2020 found that dental anxiety was more pronounced in individuals with higher levels of education^{8, 10}; Siddiqi KM et al., in 2023 and Butt H et al., in 2021 though did not report any association between education and dental anxiety^{7, 9}; while Afzal S and Zakar R in 2022 found that dental phobia was higher in uneducated adults.⁵ Further exploration is therefore needed before any meaningful

conclusion can be drawn about this relationship.

The study results also showed a significant association between occupation and dental anxiety level where patients who were unemployed were more likely to develop dental anxiety. Unemployed patients generally have limited financial resources at their disposal for any dental procedure and thus can understandably develop fear of dental treatments that are usually quite expensive. Moreover, the results did not show marital status to be significantly associated with dental anxiety level in this study. Similar findings were reported by Butt H et al., in 2021 and Rizvi SZR et al., in 2019.^{9, 18} Dental anxiety or phobia is usually based on one's self-perception and past experiences that is unlikely to be influenced by spousal opinion.

The study results did show a significant association between monthly household income and dental anxiety level where patients who had the highest income were most likely to develop dental anxiety, a finding also reported by Siddiqi KM et al., in 2023.⁷ While lower-income individuals often face barriers to dental care due to affordability concerns, higher-income individuals on the other hand may experience heightened anxiety due to an increased expectation of perfection and greater awareness of dental risks.

Limitation

It is acknowledged that being a single center study, the generalizability of study findings is limited.

CONCLUSION

It was concluded that a little less than third of the respondents were suffering from dental anxiety. Moreover, gender, education, occupation and monthly household income of the respondents were all significantly associated with their dental anxiety level. In light of study findings, targeted educational programs focusing on the availability of modern and pain-free dental treatment techniques are recommended. Moreover, financial assistance policies should be generated for low income populations to subsidize dental care. Dental anxiety assessment can also be incorporated in routine dental examinations to allow for a more tailored treatment plan for patients with higher anxiety levels.

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