

# Prevalence of dental anxiety and its association with mental health among adults in Kuantan, Malaysia

Farah Natashah Mohd<sup>1</sup>, Abdul Hadi Said<sup>2</sup>, Nurul Ruziantee Ibrahim<sup>3</sup>, Nur Afirah Maluin<sup>4</sup>, Nabila A. Rahaman<sup>4</sup>

<sup>1</sup>Special Care Dentistry Unit, Department of Oral Maxillofacial Surgery and Oral Diagnosis, Kuliyah of Dentistry, International Islamic University of Malaysia, Kuantan, Malaysia

<sup>2</sup>Department of Family Medicine, Kuliyah of Medicine, International Islamic University Malaysia, Pahang, Kuantan, Malaysia

<sup>3</sup>Oral Pathology and Oral Medicine Unit, Kuliyah of Dentistry, International Islamic University Malaysia, Kuantan, Malaysia

<sup>4</sup>Dental Officer, Ministry of Health Malaysia.

## ABSTRACT

**Background:** There is a limited number of studies on the prevalence of dental anxiety among the general population in Malaysia and its association with mental health. **Purpose:** This study aimed to assess the prevalence of dental anxiety and its association with mental health. **Methods:** This cross-sectional study was conducted among 474 adults attending a public hospital in Kuantan, Malaysia. Participants were required to answer validated, self-administered questionnaires that used the Modified Dental Anxiety Scale (MDAS) and Depression Anxiety and Stress Scale (DASS). Data were analyzed using chi-square and Mann-Whitney tests. Multiple logistic regression was used to determine the relationship between dental anxiety and other variables. **Results:** A total of 461 respondents completed the questionnaire, with a response rate of 97.3%. The prevalence of dental anxiety among respondents was very high (93.1%). We found that females were 2.3 times more likely to have dental anxiety than males. Meanwhile, an increase in age by one year reduced the likelihood of having dental anxiety by 3%. However, no significant association was found between dental anxiety and mental health. **Conclusion:** The majority of adults in Kuantan were found to have dental anxiety. Female and younger patients were more likely to have dental anxiety. Our study failed to find any association between dental anxiety and mental health.

**Keywords:** dental anxiety; depression; mental health; anxiety; stress

**Article history:** Received 6 April 2024; Revised 27 June 2024; Accepted 16 July 2024; Online 27 May 2025

Correspondence: Abdul Hadi Said, Department of Family Medicine, Kuliyah of Medicine, International Islamic University Malaysia, Pahang, Kuantan, Malaysia. Email: [abdulhadi@iium.edu.my](mailto:abdulhadi@iium.edu.my)

## INTRODUCTION

Anxiety can be defined as a universal adaptive reaction to a dangerous stimulus.<sup>1</sup> This natural response may be abnormal when it is out of proportion to the level of threat or when there are unacceptable symptoms regardless of the level of threat.<sup>2</sup> One of the categories is specific phobias, which include fears of dentistry, in which the patient might have a vasovagal response and faint upon seeing blood, injury, or an injection.<sup>1</sup>

Dental anxiety refers to a condition in which the patient will have an overwhelming sense of fear, feeling threatened by any dental treatment or doubting their ability to cope with it.<sup>3</sup> Meanwhile, dental phobia is a severe type of dental anxiety that can be illustrated by apparent and constant anxiety about dental-related objects or situations.<sup>3</sup>

It is known that dental anxiety can worsen oral health because anxious people tend to avoid dental treatment. They are usually irregular dental attendees who visit a dentist only when there are problems and tend to delay or cancel the appointment. As a result, their dental problems can progress extensively to become a dental abscess or may cause one of the following: cellulitis, Ludwig's angina,<sup>4</sup> septicemia, sepsis, sinusitis, or osteomyelitis of the face,<sup>5</sup> which may then compromise their general health. Hence, these conditions will require more complex dental treatment needs, which will likely be more invasive and painful. Consequently, their poor oral health could also affect them psychologically and socially due to the embarrassment of their oral status and reduced self-confidence.<sup>6</sup>

Despite the continuous advances made in dental-care services, dental anxiety remains a barrier to dentists,

preventing treatment from being carried out successfully. In addition, anxious patients were reported to be one of the most stressful situations for a dentist. The dentist–patient relationship may be affected, leading to unclear diagnoses that further worsen the patient’s oral health.<sup>7</sup>

Studies from a different population in Pakistan have shown around a 20% prevalence of dental anxiety, while severe dental anxiety, which includes dental phobia and avoidance of dental care, shows a prevalence of 5%.<sup>6</sup> Individuals’ sociodemographic backgrounds are shown to be related to dental anxiety. This includes young age, female gender, low education level, poor general health,<sup>4</sup> psychological disorders, and personality or psychological traits.<sup>6</sup>

However, dental anxiety among the general population in Malaysia has rarely been explored, as most studies have focused on undergraduate students, and another study by Esa et al.<sup>8</sup> was conducted on pregnant women. A study by Gunjal et al.<sup>7</sup> found that 60% of the dental undergraduate students in one of the dental schools in Malaysia have a moderate to high anxiety level. This highlights the significance of this research, as no study has been conducted among the general population in Malaysia as yet.

Furthermore, one study found general anxiety and depression to be related to oral health status and dental behavior.<sup>9</sup> People with depression were found to have certain habits that could put them at high risk of caries activity. These include ignorance of self-care, high consumption of carbohydrates and sugary meals, smoking more cigarettes than the average smoker, reduced salivary secretion associated with consumption of antidepressant medication, dry mouth sensation, and a lower frequency of daily toothbrushing.<sup>9</sup> Findings from another study showed that those who experience anxiety during dental treatment were more likely to have psychiatric disorders than those who do not. Hence, patients with dental anxiety tend to be generally anxious.<sup>10</sup> The authors of this study were interested in finding the association between dental anxiety and mental health problems such as depression, anxiety, and stress disorder. Thus, this research aimed to assess the prevalence of dental anxiety among the general population in Kuantan and its association with their sociodemographic profiles and mental health.

## MATERIALS AND METHODS

A cross-sectional study was conducted among adults attending Sultan Ahmad Shah Medical Centre (SASMEC) in Kuantan, Malaysia, from February to August 2019. Ethical approval was obtained from IIUM Research Ethics Committee (IREC 2019-013), and permission letters were sent to the Research Unit of SASMEC before conducting the research. The total sample size was calculated using a single proportion formula with 50% chosen prevalence (CL of 95%) while considering a 20% nonresponse rate. The total sample size calculated was 465 participants.

Participation in this study was voluntary, and consent was obtained from all participants. Using a purposive sampling method, the questionnaires (in hard-copy version) were distributed to 474 adults who attended SASMEC during our study period. Written consent was obtained prior to the commencement of the questionnaires. Participants were given 15–20 minutes to complete the questionnaire in a dedicated room that is separate from the general waiting area, and they were allowed to leave at any point during the session. The collected questionnaires were checked for completeness. Participants were also given the opportunity to ask whether they had any queries about the questions on the questionnaire. The inclusion criteria were adults aged 18 years old and above who had no known active psychotic disorder, such as schizophrenia and delusional disorder (as they may not have been able to answer the questionnaire appropriately), as well as having no learning disabilities. Meanwhile, the exclusion criteria were those who were illiterate as well as staff and students from the dental department.

A structured questionnaire with four sections was used throughout this study. It consisted of the Modified Dental Anxiety Scale (MDAS), the Depression Anxiety and Stress Scale (DASS), and a sociodemographic profile.

Dental-related anxiety was assessed using the MDAS, and the results were categorized into four groups: not anxious, low anxiety, moderate anxiety, and extreme anxiety (dental phobic).<sup>11</sup> This modified version of Corah’s Dental Anxiety Scale by Humphris et al.<sup>12</sup> includes questions on local anaesthesia. This scale has been translated into and validated in the Malay language.<sup>11</sup> Meanwhile, the DASS, which consists of 21 items, was used to assess the level of general anxiety, depression, and stress. Each measure was divided equally into seven questions. The questions were translated into Malay and validated, showing high internal consistency.<sup>13</sup> The MDAS and DASS questionnaires are two well-known questionnaires commonly used in Malaysia. They were translated into and validated in Malay many years ago. Hence, we did not perform any further validation or pilot test prior to this study.

Information regarding sociodemographic background, including age, gender, education, and occupation, was collected in the last section of the questionnaire. Every section included both English and Malay versions.

The IBM Statistical Package for the Social Sciences (SPSS) software version 24.0 was used for data and statistical analysis. The participants’ responses were coded into numbers; thus, no sensitive information was included in the data analysis. Univariate analysis was performed for categorical and continuous data input, including all sociodemographic backgrounds, MDAS, and DASS results. Bivariate analysis using the chi-square test was conducted to determine the association between MDAS and DASS as well as the sociodemographic profile. Initially, the MDAS score was categorized into four groups: not anxious (0–5), low anxiety (6–10), moderate anxiety (11–18), and extreme anxiety or phobic (19–25).<sup>12</sup> Meanwhile, the DASS scores

were categorized into five groups for each psychological symptom: normal, low, moderate, high, and extreme. Next, we recoded the four levels of the MDAS into two groups, which were normal (no dental anxiety) and dentally anxious, which includes low, moderate, and extreme. The five levels of the DASS were also regrouped into two groups, which were “No” (no symptoms of depression/stress/anxiety at all) and “Yes” (at least a low level of depression/stress/anxiety). These three psychological symptoms were then analyzed through bivariate analysis to assess their association with dental anxiety. The Mann-Whitney test was used, as the results were not normally distributed. Results with  $p < 0.05$  were considered statistically significant. Multiple logistic regression analysis was performed to find the true association between the variables while adjusting for possible confounding factors.

## RESULTS

A total of 474 questionnaires were distributed, and 461 were returned, making the response rate 97.3%. Five questionnaires were excluded because they were incomplete. There were almost equal numbers of male and

female participants, with 201 male participants (43.2%) and 261 female participants (56.1%). The respondents were aged between 18 and 74 years old, with a mean age of 36.9 years old. Table 1 summarizes the frequency distribution of the participants' sociodemographic profile.

Table 2 illustrates that only 6.9% of the participants are not anxious at all when having dental treatments, while 93.1% have anxiety toward dental procedures that ranges from low to extreme dental anxiety/dental phobic. Table 3 shows the DASS scores; more than 50% of respondents had a normal score, indicating that they did not have any symptoms of depression, anxiety, or stress.

A summary of the association between dental anxiety and sociodemographic factors is presented in Table 4. Interestingly, there were significant associations between dental anxiety and the participants' age and gender. Apart from these two factors, no other factors exhibited any significant association with dental anxiety.

A multiple logistic regression (Table 5) was used to further determine the relationship gender and age have with dental anxiety. Females were 2.3 times more likely to have dental anxiety than males. In terms of age, as age increased by one year, the likelihood of having dental anxiety decreased by 3%.

**Table 1.** Sociodemographic profile of respondents

Variables	Variables / Category	Study population distribution n (%)
Gender	Male	201 (43.2)
	Female	260 (56.1)
Mean age (in years) $\pm$ SD		36.87 $\pm$ 12.6
Employment status	Nonprofessional	161 (35.2)
	Professional	93 (20.4)
	Unemployed	203 (44.4)
	< RM 1000	143 (30.8)
Monthly gross income	RM1001-RM3000	132 (28.4)
	RM3001-RM5000	95 (20.4)
	> RM5001	85 (18.3)
	Primary school	5 (1.3)
Educational level	Secondary school	106 (23.0)
	Tertiary (diploma and higher)	342 (25.8)
	Regular	153 (32.9)
Dental attendance	Irregular	308 (66.1)
	Within 6 months	153 (32.9)
Last dental visit	More than 6 months previous	166 (35.7)
	More than 2 years previous	142 (30.5)

**Table 2.** Level of dental anxiety among respondents (MDAS) n (%)

Variables	MDAS score	
	n	%
Not anxious	32	6.9
Low anxiety	187	40.2
Moderate anxiety	205	44.1
Extreme anxiety / dental phobic	38	8.2

**Table 3.** Levels of depression, anxiety, and stress among respondents (DASS)

Variables	Depression n (%)	Anxiety n (%)	Stress n (%)
Normal	344 (74.0)	244 (52.5)	278 (59.8)
Low	47 (10.1)	51 (11.0)	134 (28.8)
Moderate	44 (9.5)	102 (21.9)	40 (8.6)
High	10 (2.2)	31 (6.7)	9 (1.9)
Extreme	12 (2.6)	35 (7.5)	1 (0.2)

**Table 4.** Factors associated with dental anxiety using the Mann-Whitney test

Sociodemographic profile		MDAS		p-value
		Normal n (%)	Dentally anxious n (%)	
Gender	Male	21 (10.6)	178 (89.4)	0.008
	Female	11 (4.2)	250 (95.8)	
Median age (IQR)		41 (19.0)	34 (18.0)	*0.005
Race	Malay	27 (6.4)	397 (93.6)	0.273
	Non-Malay	4 (11.8)	30 (88.2)	
	Non-Muslim	4 (13.8)	25 (86.2)	
Occupation	Professional	6 (6.5)	87 (93.5)	0.344
	Nonprofessional	14 (8.8)	146 (91.3)	
	Unemployed	10 (4.9)	193 (95.1)	
Monthly income	< 3k	15 (5.5)	259 (94.5)	0.224
	> 3k	15 (8.4)	164 (91.6)	
Education level	Primary	0 (0.0)	5 (100)	0.078
	Secondary	12 (11.3)	94 (88.7)	
	Tertiary	18 (5.3)	324 (94.7)	
Mother's education level	Primary	9 (6.7)	125 (93.3)	0.211
	Secondary	9 (4.7)	183 (95.3)	
	Tertiary	10 (10.1)	89 (89.9)	
Dental attendance	Regular	14 (9.2)	139 (90.8)	0.192
	Irregular	18 (5.9)	289 (94.1)	

\* Mann-Whitney test

**Table 5.** Multiple logistic regression table on factors associated with dental anxiety

Category		B	Wald	Exp (B)	95% C.I		p-value
					Lower	Upper	
Gender	Male (reference)						
	Female	0.833	4.483	2.301	1.064	4.978	0.034
Age		-0.028	3.930	0.972	0.946	1.000	0.047
Constant		3.309	25.029	27.358			0.000

## DISCUSSION

The present study found that the prevalence of dental anxiety among the adult population in Kuantan is markedly high, with 93.1% of respondents having low to extremely high dental anxiety. However, in this study, no direct comparison could be made with local studies. Nevertheless, this result is comparable with previous studies conducted in one of the local universities in which non-dental students had high dental anxiety.<sup>4,7</sup> As explained by Gunjal et al.,<sup>7</sup> in Malaysia, non-dental students lack dental knowledge and awareness and have fewer dental visits. Hence, more dental information should be circulated among the general population to increase their dental awareness.

Our study also found that female respondents were more likely to have dental anxiety compared to males. A similar result pattern was observed in a previous study, which described that being female was one of the main factors associated with having dental phobia.<sup>5,14,15</sup> One of the reasons behind this could be that males have a higher tendency to shield themselves from fear and anxiety due to people's perceptions of their gender role.<sup>5</sup> Furthermore, females are said to be easily affected by a stimulus and to simply express their emotions.<sup>5,15</sup>

Different age groups may exhibit different levels of dental anxiety. In the present study, younger people had a higher tendency for dental anxiety than older people.

This result is in concordance with other studies, which observed a significant reduction in dental anxiety as the age increased, especially after reaching 50 years old.<sup>16,17</sup> Mohammed et al.<sup>17</sup> suggested that older patients are exposed to other chronic and more severe diseases, which may change their perceptions toward pain and health care. Studies have proved that fears and phobia may reduce with age due to deterioration of cerebral function and adaptive endurance toward imminent events.<sup>17</sup> Nevertheless, this fact is still controversial, as some other studies have not shown any relationship between the factors.<sup>15,18</sup>

Higher education level may affect an individual's perception of dental care and routine oral hygiene practice.<sup>19</sup> However, this study showed no significant correlation between dental anxiety and education level. This result is complementary to other studies, which exhibited the same results.<sup>15,20</sup> Thus, it cannot be reliably concluded that a higher education level assures better dental behavior and perceptions of dental care.

A decent socioeconomic status may provide better access to dental health care. Logically, this should be reflected in more desirable dental behavior and perception. Yet our study demonstrates no significant association between monthly income and dental anxiety, and this is corroborated by other studies.<sup>20</sup>

Dental visits/attendance and dental anxiety were not shown to be significantly correlated in the current study.



According to a previous study, people who visit the dentist infrequently have greater levels of dental anxiety.<sup>21</sup> High levels of dental anxiety were also found to be the main cause of tooth loss, treatment cancellation, and missed dental appointments. The results of this earlier study may be strongly tied to the participants' individual dental experiences, wherein pleasant dental experiences may have reduced the likelihood of developing dental anxiety and vice versa. However, because we did not evaluate participants' prior dental experiences in the current study, we were unable to propose an explanation for this relationship. Nevertheless, our findings showed that the regularity of dental visits/attendance did not affect participants' levels of dental anxiety. Further study is necessary to assess their personal dental experiences and involve a larger sample size.

By acknowledging the factors contributing to dental anxiety, dental practitioners should be able to predict and recognize those who are more likely to have fears and anxiety in the dental chair. This is crucial in determining and modifying the dental approach to deliver successful dental treatment.

Previous studies have found that mental health problems such as depression, anxiety, and stress have a significant correlation with dental perception.<sup>9,10</sup> A person who was found to have these psychological symptoms also had a significant level of dental anxiety.<sup>9,10</sup> Nonetheless, a noteworthy finding from our research indicates that there is no correlation between any of these mental health issues and dental anxiety. This could be because previous studies used different methods in assessing depression, anxiety, and stress rather than the DASS questionnaire. The study by Pekkan et al.<sup>10</sup> used Beck's depression inventory and Beck's anxiety inventory to evaluate depression and anxiety. Furthermore, the prevalence of depression, anxiety, and stress in our study was relatively low, making the statistical analysis not strong enough. We suggest future researchers conduct a larger-scale study using randomized sampling and a variety of questionnaires to further establish this relationship. For now, perhaps it is unnecessary to be overly worried about this possible association. Dental practitioners may continue managing dental problems related to dental anxiety without being concerned about their patients' mental health.

The high frequency of dental anxiety, particularly in younger women, should be made known to dentists. The Ministry of Health Malaysia has also been actively promoting oral health to the public via social media and outreach programs. However, those with dental anxiety might not be attending the programs because of their fear.

Dental professionals should, therefore, prepare for alternative behavioral management techniques, such as conscious sedation, desensitization, or the use of technology in the office (e.g., a TV with headphones). It is encouraging to learn that most Kuantan adults do not suffer from psychological issues.

The limitation of this study was that it used a nonrandom sampling method. This reduces the ability to generalize the results of this study to the larger population. Nevertheless, the strength of this study is that it is the first survey on dental anxiety among the general adult population in Malaysia that comprises a comprehensive socioeconomic background and adequate sample size.

For future research, we advise using a randomized sampling method and including different locations in Malaysia to provide a more accurate representation of the adult population. It is also advisable to include dental procedure lists that may affect levels of dental anxiety.

There was a high prevalence of dental anxiety in Kuantan's general adult population. Younger and female respondents showed higher levels of dental anxiety. Therefore, it is imperative that all dentists are made aware of these findings. Furthermore, our research indicates that dental anxiety is a distinct issue associated with dental procedures rather than being a component of psychological issues. Patients with dental anxiety should be offered a pharmacological approach, such as conscious sedation, to assist them in getting over their fear of dental treatments.

## ACKNOWLEDGEMENT

We want to thank all respondents for participating in our study.

## REFERENCES

1. Arroll B, Kendrick T. Definition of anxiety. In: Gask L, Kendrick T, Peveler R, Chew-Graham CA, editors. *Primary care mental health*. 2nd ed. Cambridge: Cambridge University Press; 2018. p. 125–37.
2. Gask L, Kendrick T, Peveler R, Chew-Graham CA. *Primary care mental health*. 2nd ed. Cambridge: Cambridge University Press; 2018. p. 485.
3. Klingberg G, Broberg AG. Dental fear/anxiety and dental behaviour management problems in children and adolescents: a review of prevalence and concomitant psychological factors. *Int J Paediatr Dent*. 2007; 17(6): 391–406.
4. Drachev SN, Brenn T, Trovik TA. Prevalence of and factors associated with dental anxiety among medical and dental students of the Northern State Medical University, Arkhangelsk, North-West Russia. *Int J Circumpolar Health*. 2018; 77(1): 1454786.
5. Ali S, Farooq I, Khan SQ, Moheet IA, Al-Jandan BA, Al-Khalifa KS. Self-reported anxiety of dental procedures among dental students and its relation to gender and level of education. *J Taibah Univ Med Sci*. 2015; 10(4): 449–53.
6. Wide Boman U, Carlsson V, Westin M, Hakeberg M. Psychological treatment of dental anxiety among adults: a systematic review. *Eur J Oral Sci*. 2013; 121(3pt2): 225–34.
7. Gunjal S, Pateel DGS, Parkar S. Dental anxiety among medical and paramedical undergraduate students of Malaysia. *Int J Dent*. 2017; 2017: 1–5.
8. Esa R, Savithri V, Humphris G, Freeman R. The relationship between dental anxiety and dental decay experience in antenatal mothers. *Eur J Oral Sci*. 2010; 118(1): 59–65.
9. Anttila S, Knuuttila M, Ylöstalo P, Joukamaa M. Symptoms of depression and anxiety in relation to dental health behavior and self-perceived dental treatment need. *Eur J Oral Sci*. 2006; 114(2): 109–14.

10. Pekkan G, Kilicoglu A, Hatipoglu H. Relationship between dental anxiety, general anxiety level and depression in patients attending a university hospital dental clinic in Turkey. *Community Dent Health*. 2011; 28(2): 149–53.
11. Sitheeque M, Massoud M, Yahya S, Humphris G. Validation of the Malay version of the modified dental anxiety scale and the prevalence of dental anxiety in a Malaysian population. *J Investig Clin Dent*. 2015; 6(4): 313–20.
12. Humphris GM, Dyer TA, Robinson PG. The modified dental anxiety scale: UK general public population norms in 2008 with further psychometrics and effects of age. *BMC Oral Health*. 2009; 9(1): 20.
13. Musa R, Fadzil MA, Zain Z. Translation, validation and psychometric properties of Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS). *ASEAN J Psychiatry*. 2007; 8(2): 82–9.
14. Sghaireen MG, Zwiri AMA, Alzoubi IA, Qodceih SM, AL-Omiri MK. Anxiety due to dental treatment and procedures among University students and its correlation with their gender and field of study. *Int J Dent*. 2013; 2013: 1–5.
15. Oktay EA, Koçak MM, Şahinkesen G, Topçu FT. The role of age, gender, education and experiences on dental anxiety. *Gulhane Med J*. 2009; 51(3): 145–8.
16. Caltabiano ML, Croker F, Page L, Sklavos A, Spiteri J, Hanrahan L, Choi R. Dental anxiety in patients attending a student dental clinic. *BMC Oral Health*. 2018; 18(1): 48.
17. Mohammed RB, Lalithamma T, Varma DM, Sudhakar KNV, Srinivas B, Krishnamraju PV, Shaik AB. Prevalence of dental anxiety and its relation to age and gender in coastal Andhra (Visakhapatnam) population, India. *J Nat Sci Biol Med*. 2014; 5(2): 409–14.
18. Appukuttan D, Datchnamurthy M, P. Deborah S, J. Hirudayaraj G, Tadepalli A, J. Victor D. Reliability and validity of the Tamil version of Modified Dental Anxiety Scale. *J Oral Sci*. 2012; 54(4): 313–20.
19. Mohd FN, Said AH, Mohd Ibrahim MS, Abu Zarim K, Ali A, Maluin NA, A Rahaman N. Factors associated with dental attendance pattern among adults attending IIUM Health Facilities in Kuantan, Malaysia. *Malays Dent J*. 2021; 2: 42–57.
20. Eren G, Türkoğlu O. Dental anxiety in relationship to demographic status and periodontal health in adults. *Meandros Med Dent J*. 2018; 19(3): 226–32.
21. Saba Z, Katirci G. Relationship between dental anxiety levels and oral health among dental patients in Turkey: a cross-sectional study. *BMC Oral Health*. 2023; 23(1): 1–10.