

Original Article

A Study of the Psychometric Attributes of the Dental Anxiety Questionnaire

Chung-Ying Lin¹, Maryam Tofangchiha², Janneke F. M. Scheerman³, Santosh Kumar Tadakamadla⁴, Vijay Kumar Chattu^{5,6*}, Amir H. Pakpour^{2,7}

¹Institute of Allied Health Sciences, National Cheng Kung University Hospital, College of Medicine, National Cheng Kung University, Tainan 701401, Taiwan.

²Social Determinants of Health Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin 3419759811, Iran.

³Department Oral Hygiene, Inholland University of Applied Sciences, Cluster Health, Sport and Welfare, 1081LA Amsterdam, The Netherlands.

⁴School of Medicine and Dentistry & Menzies Health Institute Queensland, Griffith University, Gold Coast 4222, Australia.

⁵Division of Occupational Medicine, Department of Medicine, Temerty Faculty of Medicine, University of Toronto, Toronto, ON M5C 2CS, Canada.

⁶Department of Public Health, Saveetha Medical College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai 600077, India.

⁷Department of Nursing, School of Health and Welfare, Jönköping University, Guterigatan 5, 553 18 Jönköping, Sweden.

*E-mail ✉ vijay.chattu@mail.utoronto.ca

Received: 03 March 2024; Revised: 17 May 2024; Accepted: 20 May 2024

ABSTRACT

Dental anxiety means the patient's psychological reaction to the stress created by dental interventions. This anxiety type is common and its measurement and evaluation are very beneficial during psychiatric treatments. The current research aimed to investigate the psychometric properties of the dental anxiety questionnaire. For this purpose, 300 people who had a history of visiting a dentist were randomly selected. After obtaining informed consent to participate in the research, the dental anxiety questionnaire was completed by these people. The obtained data were analyzed using LISREL and SPSS software. The findings of exploratory factor analysis indicated the extraction of a major factor; also, the discovered structure for the dental anxiety questionnaire was confirmed through the analysis of confirmatory factors. In addition, the internal consistency of the questionnaire was studied using Cronbach's alpha method ($\alpha=0.94$) and split-half ($r=0.94$), which was high. According to the obtained results, the dental anxiety questionnaire has the necessary psychometric properties and can be used by specialists to evaluate dental anxiety.

Keywords: Psychometric properties, Questionnaire, Anxiety, Dental

How to Cite This Article: Lin ChY, Tofangchiha M, Scheerman JFM, Tadakamadla SK, Chattu VK, Pakpour AH. A Study of the Psychometric Attributes of the Dental Anxiety Questionnaire. Ann J Dent Med Assist. 2024;4(1):1-8.

Introduction

Anxiety is the phenomenon of an imaginary and imagined threat from an unfamiliar and unknown feeling. Indeed, anxiety is a vague and unpleasant feeling caused by the fact that a person expects an undesirable event to happen [1-4]. In addition, anxiety is an emotional condition that assists normal people to

reconcile and defend themselves against different dangers, anxiety disorders create problems in these adaptive responses and can cause maladaptive reactions in the extreme reactions form [5, 6].

Dental anxiety is considered a psychological reaction of fear toward dental interventions because the person suspects that these interventions are harmful and dangerous [7-9]. Dental treatment fear is common, and

about 6-15% of the general population suffers from dental anxiety [10-12]. Dental anxiety ranks fifth among common anxiety-provoking situations. Dental anxiety has an early onset and the average age of onset is 12 years. The beginning of this anxiety is from childhood and its peak is in early adulthood and reduces with age. The level of dental anxiety is more prevalent in younger ages (15-25 years and 25-35 years) and is lower in the 55-56 age group than all other age groups [1, 13, 14].

Many cross-sectional studies have shown that the prevalence of dental anxiety decreases with age and women experience this anxiety more than men [5]. A study on 503 students of different fields showed the prevalence of severe dental anxiety at the rate of 21.6% in boys and 24% in female students. Acute dental anxiety (SDA) is the most severe form of dental anxiety and it is 4 times more common in the age group of 18 to 39 years than in the age group of 60 years and hurts the health of the oral cavity and teeth. In patients with acute dental anxiety, the number of decayed, missing teeth and the loss of health of the oral-dental cavity indicate the presence of root problems, which are seen in about 57% of cases [3].

During recent decades, all dental interventions and services and even the raw materials of these services have benefited from vast technical and technological advances. In addition, infections caused by dental interventions have been greatly reduced. Anxiety related to some dental interventions, especially anxiety related to dental environments continues to bother many clients, and only a minority of patients claim that they do not experience any anxiety in dental situations. Dental anxiety is specific to dental conditions and situations, which, despite technological advances in dentistry and continuous improvements in treatment, remains one of the most common and unchanged problems [15-19].

Fear of pain has a lot to do with the development and spread of dental anxiety and avoidance of dental treatment. Very anxious patients overestimate the pain caused by dental procedures before receiving them. These patients also tend to overestimate and report the pain experienced [3, 5, 20]. This issue is one of the common problems in children as well as adults, which makes them not go to the dentist except for emergencies. The etiology of dental anxiety is not known. Considering that dental anxiety is a complex and multidimensional phenomenon, only one single factor cannot be considered involved in its creation. Among the factors influencing the creation and spread of this anxiety are personality traits, pain sensitivity, pain fear, traumatic or painful dental experiences,

especially in children (conditioning experiences), the influence of anxiety from family members or friends and peers that create fear in a person (learning/substitute modeling), fear of blood and injury, coping styles (ear to bell, avoidance, emotion-oriented) and other environmental and psychological factors. To these things, we can add the interactions between the dentist and the patient and the conversations and interactions of the patient with the dental assistant (especially when the dental assistant is angry or does not provide sufficient explanations), which are also important. In addition, many patients report that dentists make them feel guilty and blame them for being anxious. Experiencing negative emotions such as feeling out of control and feeling vulnerable can fuel this anxiety. Giving adequate information to the patient, appropriate interaction, and assuring the patient that he can terminate the dental situation if necessary, can be useful to reduce the negative feelings [1, 5, 17, 21].

Dental anxiety hinders the dentist-patient relationship and damages the treatment experience. Avoidance of dental services is common among these patients [15, 22]. Individuals with the highest levels of dental anxiety stated the highest levels of dental treatment avoidance; therefore, it seems that measuring and evaluating the level of anxiety in referring patients for dental services is very important and beneficial. Several tools have been introduced to measure the level of dental anxiety, these tools help dentists to identify patients with anxiety, estimate the prevalence of dental anxiety in their patients, and most importantly, when to use interventions to reduce anxiety [6, 19, 23].

Most of the measurements aimed at dental anxiety have been done through non-specific tools and general anxiety, so the tools that specifically deal with the desired structure are prioritized and will be clinically useful and efficient. Due to the importance of this issue, the use of a valid questionnaire that is structurally confirmed will have a high value, especially for therapists. The current research was trying to investigate the psychometric properties of the dental anxiety questionnaire [24] so that this way, an efficient tool would be available to specialists in this field.

Materials and Methods

The present study was a descriptive-correlation study and a type of psychometric study. Based on the logic of psychometric research, especially factor analysis, 300 people who had a history of visiting a dentist were selected by random sampling. Of these, 162 were women and 138 were men. The mean and standard deviation of age were for women (21.47 ± 2.65 years)

and men (23.27 ± 4.61 years). In terms of marital status, 265 people were single and 35 people were married. After obtaining the informed consent of the participants to participate in the research, they were asked to complete the questionnaire on dental anxiety. The Dental Anxiety Questionnaire, developed by Stüttgen, Melberg, and Hogastraten, is a self-report questionnaire consisting of 36 items in the form of fearful statements about dental situations. Items are answered on a 5-point Likert scale ranging from completely true (score 5) to false (score 1). It takes 5 to 10 minutes to complete the questionnaire and none of the items has reverse scoring. The questionnaire was implemented on a group of psychology master's students and then the final edition was prepared for implementation.

Regarding the examination of psychometric characteristics, the studies of the main creators of the questionnaire on dental anxiety [24] revealed that the internal consistency of the questionnaire was in the range of 0.96 to 0.98 through Cronbach's alpha. The retest reliability results of the questionnaire in different groups were obtained in the range of 0.84 to 0.87. After screening the data and discarding the distorted questionnaires, the obtained data were analyzed by SPSS and LISREL software.

Results and Discussion

Descriptive indicators related to the variable of dental anxiety, separately for men and women, are reported in **Table 1**.

Table 1. Variable descriptive indicators of dental anxiety.

Group	N	Mean	SD (Standard deviation)	Minimum amount	Maximum amount	Range
Female	162	48.43	16.75	1	166	165
Male	138	50.49	18.51	0	116	116

The reliability of the dental anxiety questionnaire was investigated through two methods internal consistency and retesting. The results showed that the internal consistency of dental anxiety questionnaire items was equal to Cronbach's alpha = 0.94 and through bisection method was equal to $r = 0.94$, which shows high and favorable internal consistency of the questionnaire. To estimate the reliability coefficient of the tool using the test-retest method, 50 volunteers were selected from the research sample and completed the dental anxiety questionnaire, and then they were tested again with the same tool after a week. The test-retest coefficient equal to $r = 0.71$ was obtained, which indicated the good reliability of the questionnaire.

The construct validity of the dental anxiety questionnaire had two stages: in the first stage, exploratory factor analysis was used in the method of principal components analysis. By performing an initial factor analysis, the data suitability for factor analysis was studied. Kaiser-Meyer-Olkin Measure, which is used to check the adequacy and sufficiency of

the research sample, was equal to 0.94, which indicated that the current sample has sufficient adequacy for analysis. In addition, Bartlett's Test of Sphericity was statistically significant ($P \leq 0.001$, 4175.34), which supported the data's factor analysis. During the factor analysis of the questionnaire, the Orthogonal Varimax method was used. The entire statistical sample ($N = 300$) was included in the factor analysis. In this analysis, only items with a factor weight of 0.4 or higher were included in a factor. In total, 6 components had an eigenvalue higher than one, but considering that the first component had an eigenvalue equal to 16.13 and that all the questions of the questionnaire were loaded on this component, it was decided to report a one-component questionnaire. It should be noted that the original creators of the questionnaire also introduced it as a single component. This component explained 44.80 % of the total variance. **Table 2** shows the total variance explained using the principal component analysis solution.

Table 2. Total variance explained using principal component analysis solution with Orthogonal Varimax method.

Agents	Initial eigenvalues			Extracted component values		
	Total	Percentage of variance	Density Percentage	Total	Percentage of variance	Density Percentage
1	16.13	44.80	44.80	16.13	44.80	44.80
2	1.80	5.01	49.81			
3	1.48	4.13	53.94			
4	1.14	3.18	57.12			

5	1.04	2.91	60.03
6	1.01	2.80	62.83
7	0.91	2.50	65.33
8	0.87	2.42	67.75
9	0.79	2.21	69.97
10	0.75	2.10	72.07
11	0.70	1.96	74.04
12	0.66	1.85	75.90
13	0.63	1.76	77.66
14	0.59	1.64	79.30
15	0.58	1.62	80.93
16	0.54	1.51	82.44
17	0.51	1.41	83.86
18	0.49	1.37	85.24
19	0.48	1.33	86.57
20	0.44	1.22	87.80
21	0.41	1.13	88.94
22	0.39	1.08	90.03
23	0.38	1.05	91.08
24	0.37	1.02	92.11
25	0.34	0.95	93.06
26	0.31	0.87	93.94
27	0.29	0.80	94.75
28	0.27	0.76	95.51
29	0.25	0.71	96.23
30	0.24	0.67	96.90
31	0.22	0.62	97.53
32	0.21	0.60	98.14
33	0.20	0.57	98.71
34	0.17	0.48	99.19
35	0.16	0.44	99.64
36	0.12	0.35	100

Table 3 shows the extracted component, the items, and the factor loadings related to each of the items. After extracting a general factor for the dental anxiety

questionnaire, to confirm the discovered structure, confirmatory factor analysis was used to test the model, the results of which are reported below.

Table 3. Results of principal components analysis and factor weights for each item.

No.	Objects	Factor load
35	When I think about sitting in the dentist's chair on the way to the dentist's office, I immediately feel anxious.	0.79
27	On the way to the dentist, I get anxious when I think about getting my teeth pierced.	0.78
33	When the dentist starts examining my teeth, I get anxious.	0.76
10	I get scared when I hear the sound of the dentist's tools in the waiting room.	0.76
28	When I imagine at home that the dentist will look at my mouth, I feel anxious.	0.75
22	As I sit in the waiting room and think about sitting in the dentist's chair, I break into a sweat and freeze.	0.74

29	When I sit in the dentist's chair and think about what will happen to my mouth, I break out in a cold sweat and my breathing slows down.	0.73
7	When I go to the dentist when I think about the sound of the dental machines, I want to go back.	0.72
4	I cannot sleep well at night when I think about my dentist appointment tomorrow.	0.72
30	As I sit in the waiting room thinking about my dentist appointment, I want to go home.	0.72
24	When I imagine at home that the dentist is going to give me a shot of anesthesia, I immediately feel anxious.	0.72
13	My breathing quickens as the dentist looks into my mouth.	0.71
31	My hands sweat when I visualize dental instruments on the way to the dentist's office.	0.71
20	I get heart palpitations when I think that the dentist will be upset about the bad condition of my teeth.	0.69
26	When I think about the fact that the dentist will say that I did not brush my teeth well, I feel worried.	0.67
8	I immediately feel anxious when I think the dentist is going to say something unpleasant about my teeth.	0.66
32	When I imagine that the dentist will be unhappy with the state of my teeth, canceling the appointment comes to mind.	0.66
3	When I am on my way to the dentist and I think about the numbing shot, I give up and want to go back.	0.66
17	When I talk to the dentist about my dental treatment, I feel anxious.	0.66
18	When I am sitting in the waiting room and I know the dentist is going to scale my teeth, I cannot focus on the magazine in my hand.	0.65
12	When I think about the moment I got my tooth pierced, I want to cancel the appointment.	0.65
23	When I think on the way to the dentist that the dentist will say that I did not take good care of my teeth, I want to go home.	0.64
34	As I wait for the dental assistant to call me into the room, I try to think of other things.	0.63
16	I want to put off dentist appointments as long as I can.	0.62
6	When I find out the dentist is going to pull my tooth, I immediately feel anxious in the waiting room.	0.62
36	When I know I have to pull one of my teeth, I cannot sleep well the night before.	0.61
21	As soon as the dentist brings the anesthesia, I close my eyes tightly.	0.61
19	When I am on my way to the dentist and I think about the smell of the dentist's office, I feel sick.	0.61
2	When I am sitting in the waiting room thinking about the dentist saying my teeth are bad, I feel the need to go to the bathroom.	0.61
15	On the way to the dentist, I get worried when I think about the fact that my teeth have plaque.	0.61
1	When the dentist invites me to sit in the dental chair, I get anxious.	0.60
11	I sweat or freeze when I think about the dentist saying I did not brush my teeth well on the way to the dentist.	0.59
14	I think I am going to want to leave the doctor's room if the dentist does not explain what he is going to do in my mouth.	0.58
25	As the dental chair reclines, I tell myself that the treatment will not take long.	0.53
5	As I lie in the chair, I think that I will never be the same again.	0.51
9	As the dentist injects me with the anesthetic, I brace my arms against the chair.	0.49

As **Table 4** shows, all the coefficients are within the desired range and the corresponding t values are high and significant at the 0.01 level.

Table 4. Standardized coefficients and t values as well as their significance in the dental anxiety measurement model.

Observed variables (questions)	Standardized coefficients	T values	Observed variables (questions)	Standardized coefficients	T values
1	0.62	9.66	19	0.66	10.33
2	0.69	11.06	20	0.71	11.55

3	0.71	11.43	21	0.65	10.15
4	0.80	13.57	22	0.81	13.84
5	0.52	7.84	23	0.69	11.13
6	0.62	9.67	24	0.76	12.60
7	0.76	12.63	25	0.55	8.32
8	0.68	10.75	26	0.69	11.16
9	0.51	7.61	27	0.80	13.60
10	0.79	13.45	28	0.81	13.76
11	0.61	9.44	29	0.79	13.39
12	0.69	11.09	30	0.79	13.32
13	0.74	12.19	31	0.79	13.44
14	0.62	9.64	32	0.73	12.02
15	0.61	9.37	33	0.80	13.69
16	0.70	11.19	34	0.61	10.86
17	0.70	11.21	35	0.85	15.29
18	0.68	10.86	36	0.65	10.28

To check the Goodness of the model Fit with the research data, the indicators related to the fit of the

model are presented. **Table 5** shows the fit indices of the dental anxiety model.

Table 5. Fit indices of dental anxiety model.

Indicator	Df	X ²	X ² /df	RMSEA	CFI	NFI	NNFI	IFI	RFI
Amount	594	1308.87	2.21	0.07	0.95	0.93	0.94	0.95	0.92

As can be seen, although the index of chi-square was significant, it can be neglected considering that this index becomes significant in cases where the size of the sample is high. Instead, instead of the index of chi-square, they expound another index called the ratio of the chi-square to the degree of freedom (X^2/df). The result of dividing the index of chi-square by the freedom degree is equal to 2.21, which is more acceptable than the critical value of 3 indices. The RMSEA (root mean square error) of the estimation index in this model is equal to 0.07. CFI (Comparative fit indices), NNFI (non-normed fit index), NFI (normalized fit index), IFI (incremental fit index), and RFI (relative goodness of fit index) are respectively equal to 0.95, 0.94, 0.93, 0.95, and 0.92. Considering that these indices values were above 0.9, as a result, they were indicators of a good fit of the model.

Dental anxiety in the first stage is one of the concerns and challenges of dentists. Dentists have stated that they suffer from discomfort when treating anxious patients and the patient's anxiety causes technical problems in the dental treatment process. Therefore, the current research has taken a step toward introducing and evaluating the psychometric indicators of the questionnaire on dental anxiety. The results revealed that the dental anxiety questionnaire has good and favorable reliability. In this regard, the findings related to internal consistency and retesting were favorable

and were in line with the results of the main creators of the scale [24].

In terms of the construct validity of the research, first, the factor structure of the questionnaire was analyzed by exploratory factor analysis. The basic assumptions of factor analysis, including the calculation of the KMO index, as well as Bartlett's sphericity test, allowed us to examine the obtained data in the form of the analysis of exploratory factors by the principal components method with orthogonal rotation. The results indicated the extraction of a single component on which all questions loaded. To achieve a solid structure, it was decided before the analysis that only questions with a factor loading above 0.4 would remain in the final version. After analysis, all the questions had a factor load above 0.5 (only question 9 had a factor load of 0.49), which indicated a high correlation between the questions and the extracted factor. Finally, the single-factor exploratory model of the dental anxiety questionnaire could explain 44.80% of the variance.

To further and deeply examine the structure of the questionnaire on dental anxiety, the exploratory single-factor model was examined through the analysis of confirmatory factors. The findings of this analysis also revealed that the standard coefficients and t values were acceptable. The goodness of fit indices indicated a good fit of the model.

Overall, considering the results obtained above, it can be claimed that this questionnaire is an efficient and useful tool that can help dentists and other professionals evaluate the patient's basic anxiety level before dental interventions. Because high dental anxiety affects the relationship between the patient and the dentist and sometimes causes incorrect diagnosis and treatment errors [25-27]. Dental anxiety is a major barrier to obtaining appropriate dental care [25].

It should be kept in mind that sometimes anxiety avoids receiving necessary dental services, and as a result, a person's dental and oral health is threatened and put at risk. Identifying, evaluating, and as a result controlling the anxiety level of patients, in addition to reducing the amount of pain, creates a positive attitude of patients towards dental services and is essential as an incentive to maintain optimal dental and oral hygiene and follow up treatment courses [25, 28].

Conclusion

The current research aimed to study the psychometric properties of the dental anxiety questionnaire. According to the obtained results, the dental anxiety questionnaire has the necessary psychometric properties and can be used by specialists to evaluate dental anxiety.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

References

1. Mohammed RB, Lalithamma T, Varma DM, Sudhakar KN, Srinivas B, Krishnamraju PV, et al. 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):408-14.
2. Dou L, Vanschaayk MM, Zhang Y, Fu X, Ji P, Yang D. The prevalence of dental anxiety and its association with pain and other variables among adult patients with irreversible pulpitis. *BMC Oral Health.* 2018;18:1-6. doi:10.1186/s12903-018-0563-x
3. Jaakkola S, Rautava P, Alanen M, Aromaa K, Pienihäkkinen H, Räihä T, et al. Dental fear: One single clinical question for measurement. *Open Dent J.* 2009;3:161-6.
4. Done AE, Preoteasa E, Preoteasa CT. Psychometric assessment of the Romanian version of the index of dental anxiety and fear (IDAF-4C+). *Healthcare.* 2023;11(15):2129. doi:10.3390/healthcare11152129
5. Walsh HR. Dental anxiety: Causes, complications and management approaches. *J Minim Interv Dent.* 2009;2(1):67-78.
6. Alansaari ABO, Tawfik A, Jaber MA, Khamis AH, Elameen EM. Prevalence and socio-demographic correlates of dental anxiety among a group of adult patients attending dental outpatient clinics: A study from UAE. *Int J Environ Res Public Health.* 2023;20(12):6118. doi:10.3390/ijerph20126118
7. Jankovi SM, Aleksi D, Bahtijari Z, Jeli A, Klačić A, et al. Risk factors for severe dental anxiety among medical students. *Vojnosanit Pregl.* 2014;71(1):16-21.
8. Faruk MO, Mamun MA, Siddique AB, Griffiths MD. Risk factors for depression and anxiety disorders among Bangladeshi dental students: A cross-sectional survey study. *Int J Ment Health Addict.* 2023;21(3):1501-14. doi:10.1007/s11469-021-00603-1
9. Muneer MU, Ismail F, Munir N, Shakoor A, Das G, Ahmed AR, et al. Dental anxiety and influencing factors in adults. *Healthcare.* 2022;10(12):2352. doi:10.3390/healthcare10122352
10. Eli I, Uziel N, Blumensohn R, Baht R. Modulation of dental anxiety. The role of past experiences, psychopathologic traits, and individual attachment patterns. *Br Dent J.* 2004;196(11):689-94.
11. Uziel N, Meyerson J, Kuskasy M, Gilon E, Eli I. The influence of family milieu on dental anxiety in Adolescents cross-sectional study. *J Clin Med.* 2023;12(6):2174. doi:10.3390/jcm12062174
12. Ghobadi A, Moradpoor H, Sharini H, Khazaie H, Moradpoor P. The effect of virtual reality on reducing patients' anxiety and pain during dental implant surgery. *BMC Oral Health.* 2024;24(1):186. doi:10.1186/s12903-024-03904-8
13. Nydell Helkimo A, Rolander B, Koch G. Dental fear in school children and young adults attending public dental health care: Prevalence and relationship to gender, oral disease and dental treatment; trends over 40 years. *BMC Oral Health.* 2022;22(1):146. doi:10.1186/s12903-022-02166-6
14. Šimunović L, Špiljak B, Radulović M, Vlahovljak A, Ostojić M, Krlev J, et al. Relationship between

- children's and parents' dental anxiety: A cross-sectional study on the six European countries. *Dent J.* 2022;10(11):209. doi:10.3390/dj10110209
15. Buchanan H. Assessing dental anxiety in children: The revised smiley faces program. *Child Care Health Dev.* 2010;36(4):534-8.
16. Yon MJY, Chen KJ, Gao SS, Duangthip D, Lo ECM, Chu CH. An introduction to assessing dental fear and anxiety in children. *Healthcare (Basel).* 2020;8(2):86. doi:10.3390/healthcare8020086
17. Hu LW, Gorenstein C, Fuentes D. Portuguese version of corah dental anxiety scale: Transcultural adaptation and reliability analysis. *Depress Anxiety.* 2007;24(7):467-71.
18. Arif K, Alam B, Khan MI, Khare A, Malhotra S, Singh B. To assess the prevalence of dental anxiety among patients visiting a teaching dental hospital in Lucknow, India, and their self-perceived treatment needs. *J Oral Biol Craniofac Res.* 2022;12(6):798-801. doi:10.1016/j.jobcr.2022.09.007
19. Woodmansey KF. The prevalence of dental anxiety in patients of a university dental clinic. *J Am Coll Health* 2005;54(1):59-62.
20. Appukuttan DP. Strategies to manage patients with dental anxiety and dental phobia: Literature review. *Clin Cosmet Investig Dent.* 2016;8:35-50. doi:10.2147/CCIDE.S63626
21. Winkler CH, Bjelopavlovic M, Lehmann KM, Petrowski K, Irmscher L, Berth H. Impact of dental anxiety on dental care routine and oral-health-related quality of life in a German adult population-A cross-sectional study. *J Clin Med.* 2023;12(16):5291. doi:10.3390/jcm12165291
22. Esa R, Hashim NA, Ayob Y, Yusof ZY. Psychometric properties of the faces version of the Malay-modified child dental anxiety scale. *BMC Oral Health.* 2015;15:28. doi:10.1186/s12903-015-0013-y
23. Alsakr A, Gufran K, Alqahtani AS, Alkharaan H, Abushanan A, Alnufaiy B, et al. Pre-treatment and post-treatment dental anxiety in patients visiting intern dental clinic. *Medicina.* 2023;59(7):1284. doi:10.3390/medicina59071284
24. Stouthard ME, Mellenbergh A, Hoogstraten J. Assessment of dental anxiety: A facet approach. *Anxiety Stress Coping.* 1993;6(2):89-105.
25. Goettems ML, Ardenghi TM, Romano AR, Demarco FF, Torriani DD. Influence of maternal dental anxiety on oral health-related quality of life of preschool children. *Qual Life Res.* 2011;20(6):951-9.
26. Slabšinskienė E, Kavaliauskienė A, Žemaitienė M, Vasiliauskienė I, Zaborskis A. Dental fear and associated factors among children and adolescents: A school-based study in Lithuania. *Int J Environ Res Public Health.* 2021;18(16):8883. doi:10.3390/ijerph18168883
27. Blumer S, Peretz B, Yukler N, Nissan S. Dental anxiety, fear and anxiety of performing dental treatments among dental students during clinical studies. *J Clin Pediatr Dent.* 2020;44(6):407-11. doi:10.17796/1053-4625-44.6.3
28. Sanikop S, Agrawal P, Patil S. Relationship between dental anxiety and pain perception during scaling. *J Oral Sci.* 2011;53(3):341-8.