

Received: 2021.02.12

Accepted: 2021.07.30

Available online: 2021.08.10

Published: 2021.10.31

Relationship of Anxiety and Depression with Perfectionism in Patients with Aesthetic All-Ceramic Repair of Anterior Teeth

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Financial support: The work was supported by the Stomatological Hospital, Southern Medical University (No. PY2018018) and the Natural Science Foundation of Guangdong Province, China (No. 2018A030313759)

Conflict of interest: None declared

Background: Many psychological problems arising from patients undergoing aesthetic repair of teeth should be considered. However, there are no published studies on the relationship between anxiety/depression and perfectionism in patients with aesthetic repair of anterior teeth.

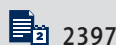
Material/Methods: A total of 640 patients receiving aesthetic repair of anterior teeth were assessed using the Corah dental anxiety scale (CDAS), a self-rating anxiety scale (SAS), a self-rating depression scale (SDS), and the Chinese version of the Frost Multidimensional Perfectionism Psychological Scale (CFMPS). Statistical analyses included use of the independent-samples *t* test, correlation analysis, and multiple stepwise regression analysis.

Results: We found that 156 patients with a high dental anxiety disorder had significantly greater SAS and SDS scores than those without a high dental anxiety disorder. There were significant differences between these patients and the non-high dental anxiety group, based on 3 dimensions of the CFMPS: concern over mistakes (CM), doubt about action (DA), and organization (OR). Patients with dental anxiety had a significant positive correlation with SAS in the categories CM and DA, with SDS in the categories CM and DA, and with personal standard (PS); OR was negatively correlated with SAS and SDS scores. Regression analysis showed that the CM and OR dimension scores of CFMPS and age had strong predictive effects on SAS scores, while CM, DA, PS dimension scores, and age were strong predictors of SDS scores.

Conclusions: The incidence of dental anxiety prior to anterior tooth repair treatment is high, and patients with dental anxiety have a significant tendency toward pursuing perfectionism.

Keywords: **AELITE Aesthetic • Dental Anxiety • Patient Health Questionnaire • Perfectionism**

Full-text PDF: <https://www.medscimonit.com/abstract/index/idArt/931593>



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Background

The number of patients seeking tooth cosmetic repair due to defects or gaps in the anterior teeth, unsightly coloring, and deformities small teeth has been increasing annually with improved aesthetic standards [1]. Such repair is typically required to enable not only good function but also to achieve the color and appearance of natural teeth [2]. In clinical work, we found that patients who chose aesthetic repair of anterior teeth often also had more stringent requirements than those opting for traditional repair. Therefore, various psychological problems arising from the aesthetic repair of anterior teeth should be considered by dentists.

Dental anxiety refers to the phenomenon where patients exhibit various degrees of fear and tension in the process of dental diagnosis and treatment and increased sensitivity, decreased tolerance, and even avoidance of treatment [3]. Patients may resist treatment for fear of pain or specific procedures, which can seriously impact the quality of treatment and ultimately damage oral health [4]. The current study found that patients with high levels of dental anxiety are more likely to exhibit psychological characteristics such as nervousness, indicating that dental anxiety may be related to individual personality characteristics [5]. Honigman et al [6] noted that anxiety and depression were psychological risk factors prior to cosmetic dentistry, which increased the possibility of patients being dissatisfied with repair outcomes.

Perfectionism is the personal tendency to pursue perfection in all aspects of daily life [7]. It has been reported that perfectionism is a risk and maintaining factor for anxiety disorders and depression [8]. In our previous study, we also found that patients with dental anxiety had a higher tendency to pursue perfectionism prior to orthodontic treatment [9]. Recent studies indicated patient satisfaction regarding the appearance of teeth is influenced by personality traits, and patients with perfectionism tended to be less satisfied with cosmetic repair outcomes [10,11].

This aim of this study was to explore the relationship of anxiety and depression with perfectionism in patients seeking aesthetic repair of the anterior teeth prior to treatment.

Material and Methods

Research Subjects

Prior to the aesthetic repair of anterior teeth, a trained doctor explained the purpose of the study to all research volunteers while they completed the questionnaire independently. To ensure clear understanding of the research process, the doctor

explained the scale options that presented difficulties for patients. The completed questionnaires were collected on-site and they were checked for possible errors and omissions. After summarizing the survey data, another 2 doctors selected 5% of the questionnaires for quality verification. Clinical diagnosis and treatment were completed by other doctors in the department, and the health care of the volunteers was not affected by participating in the study.

A total of 640 patients with cosmetic repair of the anterior teeth (321|123) who had visited the Department of Prosthodontics, Stomatological Hospital, Southern Medical University from March 2016 to February 2019 were selected. These patients were tested using CDAS, SAS, SDS, and CFMPS.

The criteria for case inclusion were patients requiring aesthetic repair of the anterior teeth due to hard-tissue defects (eg, caries, trauma, abrasion), tooth discoloration (eg, dead pulp, discolored teeth, tetracycline teeth, freckled teeth, chalky lesions), bad tooth shape (eg, small teeth, deformed teeth), irregular tooth arrangement (eg, tooth inclination, torsion, dislocation), gaps in teeth (individual or multiple gaps between front teeth), and missing teeth, among others. Patients agreed to the use of porcelain veneer or all-ceramic crowns and bridges for repair. Patients exhibited completely autonomous behavior and expression and were able to attend subsequent visits on time and complete the questionnaire survey.

Case exclusion criteria were: anterior tooth repair requiring only tooth color changes but not shape and position changes; anterior tooth repair requiring the use of a removable denture; individuals lacking completely autonomous behavior and expression; individuals receiving psychotherapy or antidepressant treatment; and individuals who did not wish to complete the questionnaire. This study was approved by the Institutional Ethics Committee of the Stomatological Hospital, Southern Medical University.

Inspection Tools

- 1) Corah dental anxiety scale (CDAS): the questionnaire comprises 4 questions, including "If you had to go to the dentist tomorrow, how would you feel about it?" Each question had 5 responses, which were scored from 1 to 5, where 1 represented "not anxious" and 5 represented "extremely anxious". When CDAS ≥ 13 , dental anxiety was confirmed [12,13].
- 2) Self-rating anxiety scale (SAS) [14]: comprises 20 items, including "I feel more nervous and anxious than usual", each of which has 4 options: "no or little time", "little time", "considerable time" and "most or total time". The higher the total score, the higher the anxiety level recorded.

- 3) Self-rating depression scale (SDS) [15]: comprises 20 items, such as, "I feel down-hearted and blue", each of which is rated as "none", "sometimes", "frequently", or "continuously". These options can effectively reflect the relevant symptoms of depression and its severity and changes. The higher the total score, the higher the recorded level of depression.
- 4) Chinese version of the Frost Multidimensional Perfectionism Psychological Scale (CFMPS) [16]: includes 5 dimensions: concern over mistakes (CM), personal standard (PS), doubt about action (DA), parental expectations (PE), and organization (OR). Examples include: "My parents set very high standards for me". A total of 27 items were scored according to 5 grades, with a total score ranging from 27 to 135. The scale has good reliability and validity in China.

Investigation Methods

- 1) Prior to the aesthetic repair of anterior teeth, a trained doctor explained the purpose of the study to all research volunteers while they completed the questionnaire independently. The doctor explained scale options that presented difficulties for patients to ensure clarity. Written informed consent was obtained from all participants. After completing the investigation, patients collected the questionnaire on-site, checked it for possible errors and omissions, and completed the survey on time. After summarizing the survey data, 5% of questionnaires were selected for quality verification.
- 2) According to the CDAS score, subjects were divided into 2 groups: the high dental anxiety group (CDAS score ≥ 13) and the non-high dental anxiety group (CDAS score < 13). Differences in SAS, SDS, and CFMPS scores between the 2 groups were compared, and the relationship between the CFMPS, SAS, and SDS scores in the high dental anxiety group was analyzed.

Statistical Analysis

PASS 11 (Power Analysis and Sample Size) was used for estimating the sample size. The dimensions of CFMPS, SAS, and SDS in the high dental anxiety groups and non-high dental anxiety groups were tested using SPSS v. 16.0, including the assessment of reliability (Cronbach's alpha was used to estimate the reliability) and validity. Correlation analysis and multiple stepwise regression analysis were performed on the dimensions of CFMPS, SAS, and SDS, respectively, in the high dental anxiety groups; $P < 0.05$ indicated a significant difference.

Results

General Situation

A total of 640 valid questionnaires were collected, with an effective rate of 91%. Among 640 patients receiving aesthetic

repair of the anterior teeth, there were 196 male and 444 female cases, with an age range of 18 to 65 years old, and an average age of 28 ± 8.66 years. There were 156 patients with high dental anxiety, accounting for 24.38%. The average CDAS score was 14.888 ± 1.38 . There were 484 patients with no high dental anxiety, accounting for 75.62%; the average CDAS score was 9.12 ± 1.45 .

Demographic Characteristics of the 2 Groups of Patients

The age and gender of the patients in the 2 groups were tested using a chi-square test. The P values were greater than 0.05, and the difference was not statistically significant (Table 1).

Comparison of SAS, SDS, and Perfectionism Scores Between the 2 Groups

According to the comparison between the 2 groups, significant differences were found in the SAS and SDS scores ($P < 0.01$), and the anxiety and depression levels of subjects in the group with dental anxiety were higher. There were significant differences in the scores for CM, DA, and OR ($P < 0.05$), indicating that subjects in the dental anxiety group scored higher in these 3 dimensions than those in the non-high dental anxiety group, and their perfectionism tendency was more obvious (Table 2).

Correlation Between Perfectionist Tendencies and SAS and SDS Scores

The results in Table 3 show that the CM and DA of CFMPS were significantly positively correlated with SAS scores ($P < 0.01$). The CM, DA and PS were significantly positively correlated with SDS scores ($P < 0.01$), while the OR was significantly negatively correlated with SAS and SDS scores ($P < 0.05$).

Regression Analysis

SAS (Y_1) and SDS (Y_2) scores were used as dependent variables, and the CM (X_1), DA (X_2), PS (X_3), PE (X_4), and OR (X_5) of perfectionism tendency were independent variables. Age (X_6) and gender (X_7) factors were also included. The stepwise regression equation was $Y_1 = 15.522 + 1.181 X_1 + 0.171 X_5 - 0.033 X_6$, and the variables included were CM, OR, and age; in the equation $Y_2 = 21.976 + 0.706 X_1 + 0.195 X_2 + 0.068 X_3 - 0.033 X_6$, variables CM, DA, PS, and age were included. The regression analysis results of perfectionism dimensions and anxiety showed that CM, OR, and age were strong predictors of anxiety (Table 4, $P < 0.05$). Furthermore, the regression analysis results of perfectionism dimensions and depression showed that CM, DA, PS, and age were strong predictors of depression (Table 5, $P < 0.05$).

Table 1. Demographic characteristics of patients in the high dental anxiety group and the non-high dental anxiety group.

Demographic characteristics	High dental anxiety group	Non-high dental anxiety group	Total	χ^2	<i>p</i>
Age (years)				7.997	0.092
≤20	24 (15.40%)	48 (9.90%)	72 (11.30%)		
21-30	94 (60.30%)	272 (56.20%)	366 (57.20%)		
31-40	30 (19.20%)	114 (23.60%)	144 (22.50%)		
41-50	6 (3.80%)	36 (7.40%)	42 (6.60%)		
≥51	2 (1.30%)	14 (2.90%)	16 (2.50%)		
Gender				0.569	0.451
Male	44 (28.20%)	152 (31.40%)	196 (30.60%)		
Female	112 (71.80%)	332 (68.60%)	444 (69.40%)		
Total	156 (24.38%)	484 (75.62%)	640 (100.00%)		

χ^2 and *p* values are derived from the univariate association analyses between the high dental anxiety group and non-high dental anxiety group.

Table 2. Comparison of scores of SAS, SDS, and CFMPS between the high dental anxiety group and the non-high dental anxiety group.

Scale	High dental anxiety group	Non-high dental anxiety group	<i>t</i>	<i>p</i>
SAS	37.69±2.91	31.19±2.43	25.217	0.000
SDS	35.77±2.01	32.66±2.40	14.615	0.000
CFMPS				
CM	13.47±2.36	11.73±1.93	8.370	0.000
DA	13.50±1.25	12.84±1.74	5.150	0.000
PS	18.64±2.05	18.46±2.41	0.934	0.351
PE	18.38±1.49	18.17±1.72	1.360	0.174
OR	23.96±1.75	22.06±2.19	11.049	0.000

SAS – self-rating anxiety scale; SDS – self-rating depression scale; CFMPS – Chinese version of the frost multidimensional perfectionism psychological scale.

Table 3. The relationship between dimensions of CFMPS and the scores of SAS and SDS.

Dimensions	SAS		SDS	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
CM	0.656	0.000	0.655	0.000
DA	0.360	0.000	0.446	0.000
PS	0.026	0.511	0.091	0.021
PE	0.072	0.069	0.033	0.404
OR	-0.085	0.032	-0.178	0.000

SAS – self-rating anxiety scale; SDS – self-rating depression scale; CFMPS – Chinese version of the frost multidimensional perfectionism psychological scale.

Table 4. Regression analysis of dimension level of CFMPS and SAS scores.

Variable	B (regression coefficient)	S.E. (standard error)	β (standard coefficient)	t	p
Constant	15.522	1.552		10.004	0.000
CM	1.181	0.054	0.678	22.014	0.000
OR	0.171	0.052	0.102	3.308	0.001
Age	-0.033	0.013	-0.075	-2.526	0.012

The dependent variable was SAS; $R^2=0.446$, adjusted $R^2=0.443$; The model equation $F=170.579$, $p=0.000$. SAS – self-rating anxiety scale; CFMPS – Chinese version of the frost multidimensional perfectionism psychological scale.

Table 5. Regression analysis of dimension levels of CFMPS and SDS scores.

Variable	B (regression coefficient)	S.E. (standard error)	β (standard coefficient)	t	p
Constant	21.976	0.935		23.507	0.000
CM	0.706	0.044	0.575	16.018	0.000
DA	0.195	0.058	0.121	3.388	0.001
PS	0.068	0.034	0.059	2.007	0.045
Age	-0.033	0.009	-0.105	-3.526	0.000

The dependent variable was SDS; $R^2=0.452$, adjusted $R^2=0.449$; The model equation $F=130.981$, $p=0.000$. SDS – self-rating depression scale; CFMPS – Chinese version of the frost multidimensional perfectionism psychological scale.

Discussion

Many factors can cause dental anxiety. The direct factors primarily refer to past poor medical experience, while indirect factors include individual personality traits, the influence of other people and the media, pain, environmental factors, and others [17]. Perfectionism is a personality trait in which a person strives to accomplish tasks at a high standard, and is accompanied by a tendency to critically evaluate oneself. Clinical studies have found that perfectionism is closely related to psychopathology and is the cause of many psychological diseases, including depression, obsessive-compulsive disorder, social phobia, and eating disorders [18]. This study explored the relationship between the perfectionist personality and anxiety and depression among patients undergoing aesthetic repair of the anterior teeth, based on individual personality traits.

The study confirmed that the prevalence rates for dental anxiety were between 3% and 20% [19-23]; 156 of 640 (24.38%) patients in this study had obvious dental anxiety, reflecting high incidence. This may have been due to the different inclusion criteria and treatment methods of the sample population and the result of psychological differences between different countries and ethnic groups requiring dental treatment.

According to the SAS and SDS scores of patients with an obvious dental anxiety disorder and patients without such a disorder, we found the former experienced a higher degree of anxiety and depression prior to orthodontic treatment and were more likely to exhibit anxiety and depression symptoms than were patients without a high dental anxiety disorder. We plan to empirically derive a preoperative psychosocial screening instrument to identify patients who may require assessment or counseling prior to treatment.

Comparing the perfectionism scores in the high dental anxiety group with those in the non-high dental anxiety group, we found that patients with dental anxiety scored higher than those of the non-high dental anxiety group in 3 dimensions: CM, DA, and OR. This indicates that patients who worry too much about making mistakes in daily life, have too many doubts about doing things, and are cautious and methodical may be more prone to anxiety and other symptoms when the need arises for aesthetic treatment of anterior teeth. In this present study, there was no statistically significant difference between the demographic characteristics (such as age and gender) of patients and dental anxiety, but for further studies are needed to assess perfectionism. The study results suggest the need to formulate corresponding treatment plans for patients with different personalities, facilitating psychological treatment when necessary.

From the results of the correlation analysis between perfectionism dimensions and depression and anxiety, it can be seen that CM, DA, and SAS scores were positively correlated. Furthermore, CM, DA, and PS were positively correlated with SDS scores, and OR was negatively correlated with SAS and SDS scores. This indicates that the more obvious the perfectionist personality, based on CM and DA dimensions, the more serious the level of anxiety among apprehensive dental patients; the more obvious the perfectionist personality, based on CM, DA, and PS dimensions, the more serious the depression of dental anxiety patients is. Concurrently, we found that in the 5 dimensions of perfectionism, OR was negatively correlated with anxiety and depression, similar to the results of previous studies. This indicates that the higher the OR score, the lower the level of anxiety and depression [24].

The regression analysis results of perfectionism dimensions and anxiety and depression showed that CM, OR, and age were strong predictors of anxiety, while CM, DA, PS, and age were strong predictors of depression. This suggests that we can predict the anxiety and depression of patients using relevant personality scales, which is of importance to the prevention and treatment of dental anxiety [25]. In addition, the results indicate that questionnaires can be a useful tool for effecting good communication between doctors and patients. Its friendly interface and easy use represent a method for facilitating such communication.

The regression equation established by perfectionism dimensions, including anxiety and depression, showed age was negatively correlated with anxiety and depression, consistent with

the results of Nieolas et al [26]. This indicates that the level of dental anxiety among patients will decrease with an increase in age, likely due to improvement in the self-regulation ability of older patients. This also highlights that, for younger patients, we should strengthen communication, return corresponding respect, and provide them with a degree of choice of treatment methods within an acceptable range.

The conclusion drawn from the above analysis is that there is a significant correlation between anxiety and depression prior to the treatment of these conditions and perfectionism among patients undergoing aesthetic repair of anterior teeth. This finding reflects those of relevant scholars in other populations, indicating that perfectionism is related to a range of medical conditions [27,28].

Conclusions

The level of anxiety and depression in patients with dental anxiety prior to the aesthetic repair of anterior teeth was high, and there was a significant correlation between the level of anxiety and depression and patients' perfectionist tendencies. The results of the present study are valuable from a clinical perspective in that for patients with high dental anxiety or patients with perfectionism, a psychological intervention should be carried out before anterior tooth aesthetic restoration to properly improve the patient's aesthetic orientation, reduce their expectations, and increase satisfaction. The results will also help select the appropriate aesthetic repair methods and materials for patients to reduce unnecessary repetitive medical treatment.

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