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Comparison of Somatization, Somatoform Dissociation, Anxiety Sensitivity, Psychological Pain, and Self-Care Behaviors in Patients With and Without Dental Anxiety

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A B S T R A C T

Purpose: The present study aimed to compare somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors in patients with and without dental anxiety.

Methods and Materials: The present study employed a causal-comparative design. The statistical population consisted of patients attending private dental clinics in Ramsar in 2025. A total of 60 individuals, including 30 patients with dental anxiety and 30 patients without dental anxiety, were selected through purposive sampling. Data collection instruments included the Dental Anxiety Inventory (DAI; Stouthard et al., 1993), Patient Health Questionnaire-15 (PHQ-15; Kroenke et al., 2002), Somatoform Dissociation Questionnaire-20 (SDQ-20; Nijenhuis et al., 1996), Anxiety Sensitivity Index (ASI; Taylor & Cox, 1998), Orbach & Mikulincer Mental Pain Questionnaire (OMMP; Orbach et al., 2003), and Self-Care Questionnaire (SCQ; Lowe & Owen, 1996). Data were analyzed using multivariate analysis of variance (MANOVA) with SPSS-24 software.

Findings: The results of multivariate analysis of variance demonstrated significant differences between patients with and without dental anxiety in somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors ($P < 0.001$). Patients with dental anxiety showed significantly higher levels of somatization, somatoform dissociation, anxiety sensitivity, fear of cardiovascular-gastrointestinal symptoms, fear of respiratory symptoms, fear of publicly observable anxiety reactions, fear of cognitive dyscontrol, and psychological pain compared to patients without dental anxiety. In contrast, self-care behaviors were significantly lower among patients with dental anxiety.

Conclusion: The findings suggest that dental anxiety is associated with heightened bodily symptom expression, dissociative bodily experiences, fear of anxiety-related sensations, and increased psychological pain, while simultaneously reducing adaptive self-care behaviors.

Keywords: *dental anxiety, somatization, somatoform dissociation, anxiety sensitivity, self-care, psychological pain*

1. Introduction

Dental anxiety is a clinically important psychological condition that interferes with oral healthcare utilization, treatment adherence, pain tolerance, and the patient–dentist relationship. Although mild apprehension before dental procedures is common, clinically meaningful dental anxiety involves persistent fear, anticipatory distress, avoidance of dental appointments, heightened physiological arousal, and negative cognitive expectations about dental treatment. Recent etiological models describe dental anxiety and dental phobia as multidetermined conditions shaped by prior painful experiences, traumatic or non-traumatic negative dental events, personality vulnerability, pain-related expectations, fear learning, and broader emotional dysregulation processes (Carter et al., 2021; De Jongh et al., 2017; Piechal et al., 2025). In clinical practice, dental anxiety is especially important because it does not remain limited to emotional distress; rather, it can delay dental visits, reduce preventive care, increase untreated oral disease, and worsen oral health-related quality of life (Ab Malek et al., 2024; Ahmadpour et al., 2020). Therefore, the study of psychological and behavioral correlates of dental anxiety is necessary not only for understanding its psychopathological mechanisms but also for improving dental care attendance, self-care behaviors, and patient-centered clinical management.

Dental anxiety is closely linked to avoidance and defensive reactions during dental treatment. Patients with high dental anxiety may postpone dental visits until pain or functional impairment becomes severe, which creates a vicious cycle in which delayed treatment increases the probability of invasive procedures, pain, and further anxiety. Reviews of dental fear pathways emphasize that dental anxiety may arise through direct conditioning, vicarious learning, informational transmission, cognitive vulnerability, and repeated negative experiences in dental settings (Armfield & Heaton, 2013; Carter et al., 2021). Adult survey evidence has also shown that dental anxiety is associated with previous unpleasant dental experiences, negative self-reported oral health, and maladaptive behavioral reactions during dental treatment (Peric & Tadin, 2024). In children and adolescents, dental fear is similarly associated with dental pain, behavioral management difficulties, and avoidance patterns, suggesting that anxiety-related responses may become established early in life and continue into adulthood if not properly addressed (Hekmatfar & Namazi, 2023; Shim et al., 2015). Studies on children's dental fear further suggest that family factors, parenting style, and dentists' perceptions of fear and coping strategies are relevant to the emergence and management of dental anxiety (Haghshenas Gorgabi et al., 2022; Kazemi et al., 2024). These findings collectively indicate that dental anxiety is embedded in a broader biopsychosocial system involving pain, cognition, bodily arousal, interpersonal experience, and health behavior.

One of the psychological mechanisms that may explain dental anxiety is somatization. Somatization refers to the tendency to experience and report psychological distress through bodily symptoms such as pain, fatigue, gastrointestinal discomfort, dizziness, palpitations, and other physical complaints without sufficient medical explanation or with disproportionate distress regarding bodily sensations. In medical and psychological settings, somatization is frequently linked to anxiety, depression, stress sensitivity, and heightened attention to internal bodily states. Validation research on somatization measures has shown that somatic symptom reporting has acceptable psychometric properties and is significantly associated with general psychological symptomatology (Abdolmohammadi et al., 2017). In dental anxiety, somatization may be especially relevant because dental treatment directly activates bodily sensations such as pressure, vibration, numbness, gagging, breathing changes, and pain anticipation. Individuals who interpret bodily sensations catastrophically may experience routine dental sensations as threatening, which intensifies anxiety and avoidance. This mechanism is consistent with findings that dental anxiety is associated with pain perception during procedures such as scaling, indicating that anxious patients may experience or evaluate dental sensations as more painful and distressing (Sanikop et al., 2011). Consequently, somatization may function as a bridge between emotional distress and dental avoidance by converting anxiety into intensified bodily concern and symptom monitoring.

A second mechanism relevant to dental anxiety is somatoform dissociation. Somatoform dissociation involves dissociative phenomena expressed in bodily systems, including anesthesia, motor inhibition, sensory disturbances, loss of voluntary control, and disruptions in the integration of bodily experience. Contemporary trauma-related dissociation models suggest that dissociation may develop when individuals experience overwhelming threat, helplessness, or stress, leading to altered integration of perception, affect, memory, and bodily experience (Nijenhuis et al., 2019; Schauer & Elbert, 2010). Although

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dental anxiety is not always trauma-based, dental treatment may resemble threat-related contexts for vulnerable individuals because it involves bodily exposure, loss of control, proximity of instruments, restricted communication, and anticipation of pain. Traumatic dental events may have stronger effects on the development of dental anxiety than ordinary unpleasant events, especially when the experience includes perceived helplessness, intense pain, or lack of control (De Jongh et al., 2017). Therefore, somatoform dissociation may be elevated in patients with dental anxiety because these patients may respond to dental cues through bodily disconnection, altered sensory processing, or defensive immobilization. This perspective is compatible with broader trauma and dissociation theories that conceptualize dissociative reactions as protective responses to overwhelming bodily or emotional threat (Nijenhuis et al., 2019; Schauer & Elbert, 2010).

Anxiety sensitivity is another key construct in understanding dental anxiety. Anxiety sensitivity refers to the fear of anxiety-related sensations based on beliefs that such sensations have harmful physical, psychological, or social consequences. It differs from general anxiety because it specifically concerns fear of the symptoms of anxiety, such as palpitations, shortness of breath, dizziness, trembling, nausea, cognitive dyscontrol, or visible signs of nervousness. Anxiety sensitivity theory proposes that individuals who fear these sensations are more likely to misinterpret normal physiological arousal as dangerous, thereby escalating anxiety responses (Taylor et al., 2022). Dental treatment can activate many sensations targeted by anxiety sensitivity, including respiratory discomfort, cardiovascular arousal, gagging, dizziness, and perceived loss of cognitive or behavioral control. Recent research has shown that anxiety sensitivity, pain sensitivity, and disgust sensitivity are relevant to dental anxiety, and that these sensitivities may shape attentional bias toward threatening dental stimuli (Stevens et al., 2021; Witcraft et al., 2021). This suggests that patients with dental anxiety may not only fear dental procedures themselves but also fear their own anxious reactions during treatment. In this sense, anxiety sensitivity may intensify dental anxiety through a feedback loop in which bodily arousal produces fear, fear increases arousal, and arousal confirms the patient's perception of danger.

Pain is central to dental anxiety, but the concept of pain should not be limited to physical pain. Psychological pain, also referred to as mental pain, is a deeply aversive subjective experience involving inner suffering, emotional anguish, perceived emptiness, loss of control, self-alienation, hopelessness, and fear of loneliness. Theoretical work has proposed psychological pain as a transdiagnostic construct that captures severe subjective distress beyond conventional categories of anxiety and depression (Meerwijk & Weiss, 2011). In dental anxiety, psychological pain may influence how individuals anticipate, tolerate, and interpret dental treatment. Studies in Iranian dental clinic samples have shown that dental anxiety is associated with pain anxiety and mental pain, suggesting that patients with higher psychological pain may be more vulnerable to dental fear and pain-related avoidance (Parvizifard et al., 2022; Taheri et al., 2024). In addition, pain perception is not merely a sensory event but is shaped by attention, expectation, memory, and emotional meaning. Dental anxiety can increase perceived pain, while pain experiences can reinforce dental anxiety, producing a reciprocal cycle of distress (Sanikop et al., 2011; Shim et al., 2015). Accordingly, psychological pain may represent an internal emotional burden that amplifies dental fear, increases threat appraisal, and weakens adaptive coping during dental care.

Self-care behaviors constitute the behavioral dimension of this problem. Oral self-care includes preventive behaviors such as regular brushing, flossing, dental check-ups, attention to oral symptoms, adherence to dental recommendations, and timely treatment seeking. More broadly, self-care is influenced by self-efficacy, motivation, emotional regulation, stress reduction, decision-making, and adaptive health beliefs. Research based on self-determination theory has shown that motivation and anxiety for dental treatment are related to oral self-care behavior and dental clinic attendance, indicating that anxious patients may struggle not only with treatment settings but also with daily oral health behavior (Münster Halvari et al., 2010). A systematic review of health behaviors, self-care, and oral health further confirms that oral health outcomes are strongly shaped by behavioral patterns and self-care engagement (Wienert et al., 2023). Studies validating and applying self-care instruments have also emphasized the relevance of self-care self-efficacy in health-related populations, including patients undergoing intensive medical treatment and chemotherapy (Azizi Fini et al., 2011; Masmouei et al., 2019). In dental anxiety, reduced self-care may emerge because anxious individuals avoid dental information, minimize oral health monitoring, delay treatment decisions, or experience low confidence in managing health-related demands. Thus, self-care behaviors

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must be examined as a core outcome of dental anxiety rather than merely as an unrelated lifestyle factor.

The importance of dental anxiety becomes even clearer when considered in relation to oral health-related quality of life. Dental fear and anxiety can reduce treatment utilization and worsen subjective oral health, while poor oral health can further increase fear, shame, and avoidance (Ab Malek et al., 2024; Buldur & Güvendi, 2020). Untreated dental caries and adverse clinical consequences have been associated with dental fear and anxiety in adults, showing that psychological fear may have measurable clinical implications (Ahmadpour et al., 2020). Moreover, dental anxiety is often linked to broader psychological vulnerabilities such as personality traits, depression, general anxiety, reduced happiness, and lower life satisfaction (Bakhtiari et al., 2014; Yousefi et al., 2020). In patients with mental disorders, dental anxiety and fear may be intensified by psychiatric symptoms, altered threat perception, and difficulties in emotion regulation (Ja, 2024). These associations indicate that dental anxiety should be understood as a multidimensional psychological condition that includes emotional, somatic, dissociative, cognitive, pain-related, and behavioral components. However, many studies have examined these variables separately, and fewer studies have compared somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors simultaneously between patients with and without dental anxiety.

From an assessment perspective, reliable measurement of dental anxiety and its related constructs is essential. The Dental Anxiety Inventory has been adapted and psychometrically evaluated in Iranian samples, supporting its use for identifying individuals with high and low dental anxiety (Yousefi & Piri, 2017). Similarly, Iranian studies have evaluated measures of somatization, psychological pain, and self-care, providing methodological support for examining these constructs in local clinical populations (Abdolmohammadi et al., 2017; Karami et al., 2018; Masmouei et al., 2019). The availability of these validated instruments makes it possible to move beyond general descriptions of dental anxiety and investigate the psychological architecture underlying it. This is particularly important in dental patients because anxiety may be expressed not only through verbal fear but also through bodily symptoms, dissociative responses, heightened sensitivity to arousal, emotional suffering, and poor engagement in self-care. In addition, emerging clinical approaches such as virtual reality for dental pain and anxiety management demonstrate that dental anxiety is increasingly being treated as a complex psychophysiological experience requiring targeted psychological and behavioral interventions (Fan et al., 2023). Yet intervention planning requires clearer evidence about which psychological dimensions differentiate anxious from non-anxious dental patients.

Overall, the literature suggests that dental anxiety is associated with unpleasant dental experiences, pain perception, anxiety sensitivity, psychological pain, oral health behavior, and health-related quality of life (Peric & Tadin, 2024; Piechal et al., 2025; Taheri et al., 2024; Witcraft et al., 2021). However, the simultaneous comparison of somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors can provide a more integrated understanding of how dental anxiety is embodied, emotionally experienced, cognitively amplified, and behaviorally maintained. Such a comparison is especially valuable because it can clarify whether patients with dental anxiety differ from non-anxious patients only in fear of dental procedures or also in broader patterns of bodily symptom reporting, dissociative bodily experience, fear of anxiety sensations, mental suffering, and reduced self-care confidence. Identifying these differences can support more precise screening, psychoeducation, referral, and interdisciplinary interventions in dental settings. Therefore, the aim of the present study was to compare somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors in patients with and without dental anxiety.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a causal-comparative design. The statistical population consisted of patients referring to private dental clinics in the city of Ramsar in 2025. A total of 60 individuals (30 patients with dental anxiety and 30 patients without dental anxiety) were selected using purposive sampling. The inclusion criteria were providing informed written consent to participate in the study, obtaining either high dental anxiety scores (scores of 144 and above) or low dental anxiety scores (scores of 72 and below) in order to be assigned to the groups with and without dental anxiety, literacy in reading and writing, and self-reported absence of acute or chronic medical and psychiatric disorders.

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2.2. Measures

Dental Anxiety Inventory (DAI; Stouthard et al., 1993): This questionnaire consists of 36 items presented as fear-related statements regarding dental situations. The items are rated on a five-point Likert scale ranging from completely false (1) to completely true (5). Completion of the questionnaire requires approximately 1 to 10 minutes, and none of the items are reverse scored. Higher scores indicate greater dental anxiety. Individuals who obtain scores of 144 or higher are considered to have high dental anxiety, whereas those with scores of 72 or lower are considered to have low dental anxiety. Stouthard et al. (1993) reported an internal consistency coefficient of 0.98 and a test–retest reliability coefficient of 0.87 for this questionnaire. Yousefi and Piri (2017) examined the validity and reliability of the questionnaire in Iran. The results of exploratory factor analysis indicated the extraction of one major factor. Furthermore, the identified structure of the Dental Anxiety Inventory in the Iranian population was confirmed through confirmatory factor analysis. Internal consistency of the questionnaire was reported as 0.94 using Cronbach's alpha and 0.94 using the split-half method, indicating high reliability.

Patient Health Questionnaire-15 (PHQ-15; Kroenke et al., 2002): The Patient Health Questionnaire-15 is a somatic symptom subscale derived from the self-report version of the Primary Care Evaluation of Mental Disorders diagnostic tool (PRIME-MD). The PRIME-MD was developed and validated in the early 1990s for diagnosing five of the most common categories of mental disorders in medical populations. These five disorders included depression, anxiety, somatoform disorders, alcohol use disorders, and eating disorders. The PHQ-15 is simple, rapid, unrestricted, and internationally applicable; however, it may not be ideal for all purposes. This questionnaire assesses the severity of common somatic complaints such as stomach and abdominal pain, low back pain, pain in the arms, legs, or joints, headaches, chest pain, dizziness, fainting or feeling weak, palpitations, shortness of breath, gastrointestinal problems (constipation/diarrhea), nausea or indigestion, fatigue or low energy, sleep problems, pain during daily activities, and bodily problems related to tension and stress on a three-point scale. It is important to note that when the PHQ-15 is used as a screening instrument, false positives may include panic disorder, generalized anxiety disorder, depressive disorders, illness anxiety disorder, functional neurological symptom disorder, delusional disorder, body dysmorphic disorder, or obsessive-compulsive disorder. The PHQ-15 has a sensitivity of 78% and a specificity of 71% for the diagnosis of somatoform disorder based on DSM-IV criteria. PHQ-15 scores of 5, 10, and 15 indicate cutoff points for low, moderate, and severe somatic symptom severity, respectively (Kroenke et al., 2002). In the study by Abdolmohammadi et al. (2017), the correlation coefficient between PHQ-15 scores and the Symptom Checklist-90 (SCL-90) was 0.77 and statistically significant. The internal consistency of the questionnaire, calculated using Cronbach's alpha, was 0.76.

Somatoform Dissociation Questionnaire-20 (SDQ-20; Nijenhuis et al., 1996): This questionnaire was designed with 20 items to assess the severity of symptoms commonly observed in dissociative disorders. These symptoms include anesthesia (loss of visual, auditory, gustatory, and olfactory perception), amnesia (loss of the ability to retrieve information), and loss of volitional control (loss of willpower or autonomy and restriction in the range of emotional expression and experience). The items are rated on a continuum from 1 (lowest symptom severity) to 5 (highest symptom severity), with higher scores indicating greater somatoform dissociation. The internal consistency of the questionnaire has been reported as 0.95 (Nijenhuis et al., 1996).

Anxiety Sensitivity Index (ASI; Taylor & Cox, 1998): This questionnaire consists of 30 items rated on a five-point Likert scale ranging from very little to very much. The scale assesses four factors: fear of respiratory symptoms, fear of publicly observable anxiety reactions, fear of cardiovascular symptoms, and fear of cognitive dyscontrol. Taylor and Cox (1998) reported Cronbach's alpha coefficients ranging from 0.83 to 0.94 for the internal consistency of this scale. The questionnaire was standardized in Iran by Moradi-Mansh (2007). Of the 36 original items, six items were removed due to inconsistency with the factors in which they were categorized. The results of confirmatory factor analysis using varimax rotation and the scree test indicated the presence of four factors: "fear of cardiovascular-gastrointestinal symptoms," "fear of respiratory symptoms," "fear of publicly observable anxiety reactions," and "fear of cognitive dyscontrol." Together, these factors explained more than 58% of the total variance of the test. The reliability of the index was assessed using internal consistency, test–retest reliability, and split-half reliability methods, yielding coefficients of 0.93, 0.95, and 0.97, respectively, for the total scale. Reliability coefficients for the subscales ranged from 0.82 to 0.91 for internal

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consistency, 0.92 to 0.96 for test–retest reliability, and 0.76 to 0.90 for split-half reliability. The validity of the revised Anxiety Sensitivity Index was examined through concurrent administration with the Symptom Checklist-90 (SCL-90), resulting in a correlation coefficient of 0.56. Correlations between the subscales of the revised Anxiety Sensitivity Index and the total score were satisfactory and ranged from 0.74 to 0.88. Intercorrelations among the subscales ranged from 0.40 to 0.68.

Orbach & Mikulincer Mental Pain Questionnaire (OMMP; Orbach et al., 2003): This questionnaire was developed by Orbach et al. (2003) and consists of 44 items rated on a five-point Likert scale ranging from completely disagree (1) to completely agree (5). In the study by Orbach et al. (2003), the extracted factors explained 64.3% of the variance in scores, and internal consistency coefficients for the subscales ranged from 0.78 to 0.95. Karami et al. (2018) investigated the validity and reliability of this scale in Iran. The results of exploratory factor analysis identified six factors, which together explained 66.40% of the variance in psychological pain. Confirmatory factor analysis supported the 44 items across six factors. Cronbach's alpha coefficients were 0.966 for the total psychological pain questionnaire, 0.952 for emptiness and worthlessness, 0.893 for confusion and emotional turmoil, 0.877 for loss of control, 0.872 for irreversibility, 0.869 for social distancing/self-alienation, and 0.617 for fear of loneliness.

Self-Care Questionnaire (SCQ; Lowe & Owen, 1996): This questionnaire was developed by Lowe and Owen (1996) and contains 29 items. The questionnaire is scored on a five-point Likert scale ranging from very little confidence (1) to complete confidence (5). It includes four dimensions: adaptation, stress reduction, decision-making, and enjoyment of life. The items assess the individual's level of confidence in performing the specified behaviors, and the total score ranges from 29 to 145. The items related to each dimension are as follows: stress reduction (Items 1–10), decision-making (Items 11–13), enjoyment of life (Items 14–15), and adaptation (Items 16–29). Lowe and Owen (1996) reported an internal consistency coefficient of 0.94 using Cronbach's alpha. In the original study, the correlation coefficient between scores on this questionnaire and scores on the Health Behavior Scale was 0.61. This questionnaire was first translated into Persian by Azizi Fini et al. (2011), and its content validity was confirmed by ten faculty members from Iran University of Medical Sciences. The reliability of the translated instrument was assessed using the test–retest method with a one-week interval among ten patients in the bone marrow transplantation ward, yielding a Pearson correlation coefficient of 0.94 between the two administrations. The validity and reliability of this questionnaire were also examined in the study by Masmouei et al. (2019), where a correlation coefficient of r = 0.75 and a Cronbach's alpha coefficient of 0.96 were obtained, indicating satisfactory internal consistency.

2.3. Data Analysis

Data were analyzed using multivariate analysis of variance (MANOVA) with SPSS-24 software.

3. Findings and Results

In both groups, there were equal numbers of women and men (15 women and 15 men in each group). The mean age of patients with and without dental anxiety was 26.58 and 25.13 years, respectively. The non-significant result of the independent samples t-test indicated that there was no significant difference between the two groups in terms of age. The means and standard deviations of the research variables for the two groups are presented in Table 1.

Table 1

Means and Standard Deviations of the Research Variables by Group

Group	Variable	Mean	Standard Deviation
Patients with Dental Anxiety	Dental Anxiety	152.48	3.64
	Somatization	49.18	0.82
	Somatoform Dissociation	87.05	1.72
	Anxiety Sensitivity	140.56	3.04
	Fear of Cardiovascular-Gastrointestinal Symptoms	32.58	0.87
	Fear of Respiratory Symptoms	35.73	0.81
	Fear of Publicly Observable Anxiety Reactions	33.54	0.69
	Fear of Cognitive Dyscontrol	38.71	0.95
	Psychological Pain	149.37	1.56
	Self-Care	47.34	0.84

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Patients without Dental Anxiety	Dental Anxiety	35.72	3.28
	Somatization	28.44	0.92
	Somatoform Dissociation	41.72	0.97
	Anxiety Sensitivity	85.03	1.20
	Fear of Cardiovascular-Gastrointestinal Symptoms	19.61	0.92
	Fear of Respiratory Symptoms	24.85	0.87
	Fear of Publicly Observable Anxiety Reactions	17.08	0.64
	Fear of Cognitive Dyscontrol	23.49	1.18
	Psychological Pain	81.55	3.97
	Self-Care	98.01	3.24

As shown in Table 1, the mean scores of somatization, somatoform dissociation, anxiety sensitivity and its subscales, as well as the total score of psychological pain, were higher in patients with dental anxiety compared to patients without dental anxiety. In contrast, the mean score of self-care was lower in patients with dental anxiety than in patients without dental anxiety. The non-significant Levene's test indicated homogeneity of variances. To examine differences in somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors between patients with and without dental anxiety, multivariate analysis of variance (MANOVA) was conducted, and the results are presented in Table 2.

Table 2

Results of Analysis of Variance Comparing Somatization, Somatoform Dissociation, Anxiety Sensitivity, Psychological Pain, and Self-Care Behaviors in Patients With and Without Dental Anxiety

Variable	Source	df	Mean Square	F	Significance Level
Anxiety Sensitivity	Group	1	10341.53	81.40	0.000
	Error	57	859.34		
	Total	58			
Somatization	Group	1	8249.21	19.20	0.000
	Error	57	608.52		
	Total	58			
Somatoform Dissociation	Group	1	9283.17	307.00	0.000
	Error	57	768.20		
	Total	58			
Psychological Pain	Group	1	11932.07	584.00	0.000
	Error	57	1162.28		
	Total	58			
Self-Care Behaviors	Group	1	8749.02	283.00	0.000
	Error	57	714.53		
	Total	58			

As shown in Table 2, there were significant differences between the two groups in somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors ($P < 0.001$). Therefore, based on the means presented in Table 1, it can be concluded that patients with dental anxiety had significantly higher levels of somatization, somatoform dissociation, anxiety sensitivity, and psychological pain, as well as significantly lower self-care behaviors, compared to patients without dental anxiety.

4. Discussion and Conclusion

The present study was conducted with the aim of comparing somatization, somatoform dissociation, anxiety sensitivity, psychological pain, and self-care behaviors in patients with and without dental anxiety. The findings demonstrated that patients with dental anxiety had significantly higher levels of somatization, somatoform dissociation, anxiety sensitivity, and psychological pain compared to patients without dental anxiety. In contrast, self-care behaviors were significantly lower among patients with dental anxiety. These findings indicate that dental anxiety is not limited to fear of dental procedures alone, but rather represents a multidimensional psychological condition involving maladaptive bodily perception, heightened sensitivity to anxiety-related sensations, dissociative responses, emotional suffering, and impaired

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health-related behavioral functioning. The obtained findings support multidimensional conceptualizations of dental anxiety proposed in contemporary literature, which emphasize the interaction of cognitive, emotional, behavioral, and physiological factors in the development and maintenance of dental fear (Carter et al., 2021; Piechal et al., 2025).

One of the main findings of the present study was that somatization was significantly higher in patients with dental anxiety than in patients without dental anxiety. This finding is theoretically meaningful because dental procedures inherently involve bodily sensations, pain anticipation, physical proximity, and physiological arousal, all of which may intensify symptom monitoring and bodily threat interpretation in vulnerable individuals. Patients with high dental anxiety may excessively focus on internal bodily sensations such as palpitations, nausea, dizziness, muscular tension, or pain expectancy, thereby amplifying physical discomfort and emotional distress. This interpretation is consistent with evidence indicating that dental anxiety is strongly associated with pain perception and exaggerated fear responses to dental procedures (Sanikop et al., 2011; Shim et al., 2015). Furthermore, the findings align with research demonstrating associations between dental anxiety and broader psychological symptomatology, including anxiety-related physical complaints and emotional distress (Ahmadpour et al., 2020; Yousefi et al., 2020). Since somatization involves the expression of emotional distress through bodily symptoms, anxious dental patients may transform anticipatory fear into physical discomfort, thereby reinforcing avoidance behavior and negative expectations regarding dental treatment. Validation studies of somatic symptom measures also support the close relationship between somatization and psychological distress (Abdolmohammadi et al., 2017). Therefore, somatization appears to function as an important mechanism through which dental anxiety becomes embodied and behaviorally maintained.

Another important finding was that patients with dental anxiety showed significantly higher levels of somatoform dissociation than patients without dental anxiety. This finding can be explained within trauma-related and dissociative models of stress response. Somatoform dissociation refers to disturbances in bodily integration, including sensory disruptions, motor inhibition, anesthesia, and altered bodily awareness. According to structural dissociation theory, dissociative reactions emerge when individuals are exposed to threatening or overwhelming situations that exceed their coping capacity (Nijenhuis et al., 2019). Dental settings may activate such responses because they involve helplessness, restricted control, exposure to invasive procedures, and fear of pain. Previous evidence suggests that traumatic dental experiences may have stronger effects on the development of dental anxiety than ordinary unpleasant events (De Jongh et al., 2017). Similarly, dissociation following stress and threat exposure has been conceptualized as a defensive mechanism intended to reduce emotional overload and perceived danger (Schauer & Elbert, 2010). In anxious dental patients, dissociative bodily responses may reduce awareness of distress in the short term but simultaneously interfere with adaptive emotional regulation and treatment engagement. Thus, elevated somatoform dissociation among patients with dental anxiety may reflect a maladaptive defensive strategy activated in response to anticipated threat and bodily vulnerability during dental treatment.

The present findings also showed that anxiety sensitivity and all of its subcomponents were significantly higher in patients with dental anxiety. This result is highly consistent with theoretical and empirical literature on anxiety sensitivity and fear-based disorders. Anxiety sensitivity refers to the fear of anxiety-related sensations due to beliefs that these sensations may produce harmful physical, cognitive, or social consequences (Taylor et al., 2022). Dental procedures often trigger physiological arousal, including increased heart rate, shortness of breath, sweating, dizziness, gagging, and trembling. Individuals with high anxiety sensitivity may catastrophically interpret these reactions as signs of loss of control, danger, or humiliation, thereby intensifying their dental anxiety. Previous studies have demonstrated that sensitivity to anxiety, pain, and disgust are central contributors to dental anxiety (Witcraft et al., 2021). Stevens et al. also found that anxiety sensitivity contributes to attentional bias toward threatening dental stimuli, suggesting that highly sensitive individuals selectively attend to fear-related cues in dental contexts (Stevens et al., 2021). The current findings support these perspectives by demonstrating that fear of cardiovascular-gastrointestinal symptoms, fear of respiratory symptoms, fear of observable anxiety reactions, and fear of cognitive dyscontrol are all elevated among patients with dental anxiety. This indicates that anxious dental patients fear not only dental procedures themselves but also their own physiological and emotional responses during treatment. Such interpretations are also compatible with broader cognitive vulnerability models of dental anxiety, which

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emphasize catastrophic expectations and heightened threat perception (Armfield & Heaton, 2013; Carter et al., 2021).

Another central finding of the present study was the significantly higher level of psychological pain among patients with dental anxiety. Psychological pain reflects profound emotional suffering characterized by feelings such as helplessness, emptiness, worthlessness, emotional confusion, alienation, and perceived loss of control (Meerwijk & Weiss, 2011). The relationship between dental anxiety and psychological pain may be explained through several mechanisms. First, individuals with high psychological pain may perceive stressful situations, including dental treatment, as more threatening and emotionally intolerable. Second, repeated avoidance of dental care due to anxiety may contribute to shame, guilt, helplessness, and deteriorating oral health, thereby increasing emotional suffering. Third, anticipatory fear of pain may interact with broader emotional distress and intensify mental suffering during treatment anticipation. These interpretations are supported by studies showing associations between mental pain, pain anxiety, and dental anxiety among dental clinic attendees (Parvizifard et al., 2022; Taheri et al., 2024). The findings are also consistent with research emphasizing the reciprocal relationship between pain perception and anxiety in dental contexts (Sanikop et al., 2011; Shim et al., 2015). Patients who experience elevated psychological pain may possess lower emotional tolerance for discomfort, making routine dental procedures psychologically overwhelming and emotionally destabilizing. Therefore, psychological pain may represent an important emotional substrate underlying exaggerated fear and avoidance responses in dental anxiety.

The findings further indicated that self-care behaviors were significantly lower among patients with dental anxiety. This finding is particularly important because it highlights the behavioral consequences of dental anxiety beyond emotional distress alone. Self-care behaviors include preventive oral health practices, health responsibility, stress management, adaptive decision-making, and confidence in maintaining personal health. Patients with dental anxiety may avoid preventive dental visits, neglect oral hygiene, postpone treatment decisions, and disengage from oral health maintenance due to fear and anticipatory distress. This interpretation aligns with evidence suggesting that dental anxiety negatively affects dental attendance and oral health-related quality of life (Ab Malek et al., 2024; Buldur & Güvendi, 2020). Research based on self-determination theory also indicates that anxiety related to dental treatment is associated with poorer oral self-care behaviors and reduced clinic attendance (Münster Halvari et al., 2010). Similarly, systematic reviews have emphasized the importance of self-care and health behaviors in maintaining oral health outcomes (Wienert et al., 2023). Since self-care self-efficacy is closely associated with adaptive health management (Azizi Fini et al., 2011; Masmouei et al., 2019), anxious dental patients may experience reduced confidence in their ability to manage oral health effectively. Consequently, fear-driven avoidance may weaken preventive behavior and create a cycle in which worsening oral health further increases anxiety and treatment avoidance.

The current findings also support biopsychosocial conceptualizations of dental anxiety. Rather than viewing dental anxiety solely as a simple phobic reaction, the present results suggest that dental anxiety is associated with a complex interplay of bodily vulnerability, emotional suffering, maladaptive cognitive interpretation, and behavioral impairment. Studies examining etiological pathways of dental anxiety have emphasized the role of prior unpleasant experiences, fear conditioning, personality characteristics, and cognitive vulnerability (Peric & Tadin, 2024; Piechal et al., 2025). In addition, studies involving children and adolescents have shown that behavioral responses during treatment and interpersonal experiences may contribute to the persistence of dental fear over time (Haghshenas Gorgabi et al., 2022; Hekmatfar & Namazi, 2023). The present study extends these findings by demonstrating that patients with dental anxiety differ not only in fear levels but also in broader psychological functioning, including dissociative bodily experience, anxiety sensitivity, and psychological pain. This broader understanding is clinically important because interventions focusing only on symptom reduction may overlook deeper emotional and bodily processes maintaining dental fear.

The present findings also have implications for psychological and dental interventions. The observed relationships between dental anxiety, somatization, dissociation, anxiety sensitivity, and psychological pain suggest that treatment approaches should extend beyond behavioral management techniques alone. Psychological interventions targeting emotional regulation, bodily awareness, pain-related cognition, and catastrophic interpretation of physiological arousal may improve treatment outcomes in anxious dental patients. Reviews on the management of dental fear and anxiety emphasize the importance of multidimensional interventions including

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psychological preparation, communication enhancement, relaxation, cognitive restructuring, and patient-centered approaches (Armfield & Heaton, 2013; Carter et al., 2021). Furthermore, emerging approaches such as virtual reality-based interventions have shown promising effects in reducing dental pain and anxiety by modifying attentional focus and emotional responses during treatment (Fan et al., 2023). Understanding the psychological characteristics associated with dental anxiety may therefore facilitate individualized intervention planning and improve cooperation during dental care.

Overall, the present study demonstrated that patients with dental anxiety experience greater somatization, somatoform dissociation, anxiety sensitivity, and psychological pain, along with poorer self-care behaviors, compared to patients without dental anxiety. These findings support multidimensional models of dental anxiety and indicate that dental fear is closely intertwined with bodily symptom processing, emotional suffering, cognitive vulnerability, and health behavior impairment. Therefore, dental anxiety should be conceptualized not merely as situational fear but as a broader psychological condition involving maladaptive emotional and bodily regulation processes.

One limitation of the present study was the use of a causal-comparative design, which prevents conclusions regarding causal relationships among the variables. In addition, the sample size was relatively limited and restricted to patients attending private dental clinics in one city, which may reduce the generalizability of the findings to other populations. Another limitation was the reliance on self-report questionnaires, which may be influenced by response bias, social desirability, or inaccurate self-perception. Furthermore, variables such as socioeconomic status, personality disorders, history of trauma, and severity of dental conditions were not controlled and may have affected the results.

Future research is recommended to use longitudinal and experimental designs in order to clarify the causal relationships between dental anxiety and psychological variables such as somatization, dissociation, anxiety sensitivity, and mental pain. It is also suggested that future studies investigate mediating and moderating variables including personality traits, attachment styles, emotional regulation strategies, coping mechanisms, and trauma history. Comparative studies across different age groups, cultures, and clinical populations may further improve understanding of the developmental and contextual factors influencing dental anxiety. In addition, intervention studies examining the effectiveness of psychological treatments, psychoeducation, mindfulness-based interventions, and virtual reality approaches on reducing dental anxiety and improving self-care behaviors are strongly recommended.

From a practical perspective, dental professionals should pay greater attention to the psychological dimensions of dental anxiety during patient assessment and treatment planning. Screening for anxiety sensitivity, emotional distress, and maladaptive bodily responses may help identify high-risk patients before treatment begins. Dentists may also benefit from training in communication skills, emotional reassurance, and anxiety management techniques to improve patient cooperation and reduce fear-related avoidance. Interdisciplinary collaboration between psychologists and dental practitioners could facilitate more comprehensive treatment approaches for anxious patients. In addition, psychoeducational programs aimed at improving self-care behaviors, stress management, and coping skills may contribute to better oral health outcomes and reduced treatment avoidance among individuals with dental anxiety.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the study and participated in the research with informed consent.

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