Investigation of the Relationship between Mindfulness Awareness, Anxiety, Dental Anxiety, and Oral Hygiene Status in Population

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Abstract

Abstract and Objectives: Attention and awareness are essential features of human nature. Mindfulness can be defined as increased attention and awareness of the experience that exists in the present moment. Dental anxiety is a state of intense restlessness that develops due to fear and delusions due to dental examination and treatment. Periodontitis, periodontal plaque, and bleeding are known as major periodontal diseases. There are many different reasons for the development of these diseases, including the education level of the person, his knowledge of health and oral health, the state of physician and hospital concerns, and awareness. Our study, it was aimed to investigate whether the level of mindfulness and dental anxiety status of individuals influences periodontal health by using different scales.

Materials and Methods: In our study, 100 systemic and psychologically healthy patients, aged 25-35, at least high school graduates, who applied to Atatürk University Faculty of Dentistry for dental examination and treatment were included. First of all, the Mindful Attention Awareness Scale (MAAS), Spielberger's State-Trait Anxiety Inventory (STAI-1, STAI-2), Modified Dental Anxiety Scale (MDAS), and Dental Fear Survey (DFS) tests were applied to the patients. Then, a periodontal examination of the patients was performed and plaque indices and bleeding indices were determined.

Results: No correlation was found between the Mindful Attention Awareness Scale (MAAS) and periodontal bleeding, and plaque index.

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Introduction

Mindfulness refers to an emotional balance that includes avoidance, acceptance of internal experience, affective hunger, the ability to regulate emotions and mood, and cognitive flexibility [1]. Attention and awareness are fixed features of normal human functioning, but mindfulness can be defined as increased attention and awareness of the present experience [2]. Although this situation is determined by many different scales, the Mindful Attention Awareness Scale (MAAS) developed by Brown and Ryan [2] is generally used. This scale is a tool that measures time awareness and attention.

Anxiety, one of the most frequently used concepts throughout the history of humanity, means "worry, fear" [3]. The STAI-1 and STAI-2 scales were developed by Spielberg et al. [4] to measure persistent and instantaneous anxiety levels. While STAI-2 determines the susceptibility to anxiety experienced in individuals, STAI-1 determines the fear felt by the individual due to the stress or pressure situation at the moment.

Anxiety is the uneasiness against an unknown danger, while fear is the behavior shown towards a known situation. Dental anxiety is a condition that occurs as a result of fears and delusions due to dental examination and treatment. The Dental Fear Survey (DFS) is a scale created to evaluate dental fear and anxiety. The modified dental anxiety scale (MDAS) was developed by Humphris et al. It was introduced as a self-assessment method [5].

The term periodontal disease includes chronic inflammatory diseases of the gingiva, alveolar bone, and periodontal ligaments that support the tooth. Periodontal diseases begin with gingivitis, a localized inflammation of the gingiva caused by bacteria in the microbial dental plaque formed on the tooth and gingiva, and turns into periodontitis, which affects the tissues around the tooth, resulting in increased probing depth, gingival recession, or both, resulting in the periodontal ligament and alveolar bone destruction [6-8].

Löe et al.'s experimental gingivitis study [9] showed a cause-effect relationship between plaque accumulation and gingivitis revealing that plaque/biofilm is the primary risk factor for periodontal diseases. A preventive program that includes well-performed oral hygiene and professional care can provide effective and long-term management of periodontal disease, resulting in low dental mortality and low incidence of periodontal disease.

It has been reported that conditions such as worry, anxiety, and anxiety may create an environment for periodontal problems, and may adversely affect the responses to periodontal treatments and wound healing in periodontal tissues [10,11]. It can be thought that there may be a positive relationship between the conscious awareness levels of individuals and their oral hygiene, and as a result of the increased awareness of individuals, their oral hygiene will improve and plaque or periodontal problems will decrease.

In many previous studies [12,13], dental anxiety levels have been assessed in specific populations and their relationship to Spielberger's State-Trait Anxiety Inventory (STAI-1 and STAI-2) [14] has been examined. The relationship of the Mindful Attention Awareness Scale (MAAS) with depression and anxiety was also examined [15]. Our study is important in terms of examining the relationship between the Modified Dental Anxiety Scale (MDAS), Dental Fear Survey (DFS), Mindful Attention Awareness Scale (MAAS), Spielberger's State-Trait Anxiety Inventory (STAI-1 and STAI-2) scales and periodontal bleeding, plaque index.

We hypothesize that individuals' conscious awareness, anxiety, and fear may affect periodontal health. In this study, we aimed to evaluate the relationship between the values obtained by using the Mindful Attention Awareness Scale (MAAS), Spielberger's State-Trait Anxiety Inventory (STAI-1, STAI-2), Modified Dental Anxiety (MDAS), Dental Fear Survey (DFS) and periodontal bleeding, plaque indexes of the same patients.

Materials and Methods

Study Plan:

A total of 100 systemically and psychologically healthy patients (50 women, 50 men) who applied to

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Atatürk University Faculty of Dentistry, who was educated in high school and above between the ages of 25-35 were included in this study. Mindful Attention Awareness Scale (MAAS), Spielberger's State-Trait Anxiety Inventory (STAI-1, STAI 2), Modified Dental Anxiety (MDAS), and Dental Fear Survey (DFS) tests were applied to the patients. After the tests were performed, a periodontal examination was performed on the patients. The plaque and bleeding indices of the patients were evaluated.

Mindful Attention Awareness Scale (MAAS):

In the study, the conscious awareness values of the patients were evaluated by applying the Mindful Attention Awareness Scale (MAAS). MAAS is a 6-point Likert type scale consisting of 15 items (1=almost always, 2=most often, 3=sometimes, 4=rarely, 5=very rarely, 6=almost never) and was applied to all patients by the same researcher. The PPE values of the patients were evaluated by a single psychiatrist without knowing the periodontal status of the patients.

Modified Dental Anxiety Scale (MDAS):

In our study, a modified dental anxiety scale was used to determine dental anxiety. There are 5 questions in the modified dental anxiety scale applied to patients. Each question had five points, ranging from 'not anxious' to 'overly anxious', in ascending order from 1 to 5. Therefore, the total possible maximum score for the entire scale was 25, with each question valued between 1 and 5 points. All measurements were made by the same psychiatrist.

Dental Fear Survey (DFS):

In our study, a dental fear scale was used to determine dental fear. The dental fear scale consists of 20 items. It has a representative five-fold scale to be rated from 5 to 1, which evaluates fear and anxiety [16]. All measurements were made by the same psychiatrist.

Spielberger's State-Trait Anxiety Inventory:

Spielberger's Steady-State Anxiety Inventories were used to determine patients' immediate states and concerns. STAI-I and STAI-II consist of 20 items. The minimum score for both sections is 20 and the maximum score is 80. High scores indicate high levels of anxiety, while low scores indicate low levels of anxiety. All measurements were made by the same psychiatrist.

Periodontal Examination:

Periodontal bleeding and plaque indices were measured using the WHO sond. Plaque scores of the patients were calculated using Aproximal Plaque Index (API). Plaque sites were evaluated positively. The percentage of the regions with positive was calculated by proportioning all the regions evaluated. The patient's bleeding scores were calculated using the Modified Sulcus Bleeding Index (MOD-SBI). For this purpose, the approximal region of each tooth was probed and the bleeding areas were positively marked. The sum of the regions that were evaluated positively was divided by the sum of the available measurement locations and the result was multiplied by 100. Periodontal pocket measurement was performed on the approximal surfaces of all teeth. Pockets of 4 mm or more were evaluated and recorded pathologically. All periodontal measurements were performed by the same researcher.

Statistical Analysis:

Data analysis was performed using SPSS 21.0for Windows software. The data were obtained from the patients after all eight scales were scored by the scoring guidelines. Qualitative data are expressed as numbers and percentages, while quantitative data are expressed as average ± standard deviation (SD). The compatibility of the data with the normal distribution probability/hypothesis was analyzed using the Shapiro-Wilk test. An independent Student's t-test was used to determine the difference between the two groups, and a one-way ANOVA and Tukey HSD post hoc test was used for more than two groups. Pearson correlation coefficient was used to determine the relationship between the scales. The effect size (d) for the T-test was 0.48 and the effect size (f) for unidirectional ANOVA was 0.20. According to these analyzes, the significance level was accepted as $p < 0.05$. When the power analysis was performed at 90% power (0.90) at a 0.05 significance level and 0.1 effect size, the number of participants was determined as 100.

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Results

No correlation was found between age and any index in the study. A positive weak correlation was found between bleeding and plaque index (r=,293 p=0,039). No correlation was found between the bleeding index and other indices. There was a positive weak correlation between plaque index and MDAS (r=,342 p=0,015). There was a strong correlation between STA-1 and STA-2 (r=,755 p=0). A very strong correlation was observed between MDAS and DFS (r=,817 p=0). A moderate correlation was found between MAAS and STA-1 (r=,459 p=0,001). A strong correlation was found between MAAS and STA-2 (r=,630 p=0). A moderate correlation was found between DFS and STA-1 (r=,531 p=0). Also, a moderate correlation was found between DFS and STA-2 (r=,459 p=0,001). A moderate correlation was found between MDAS and STA-1 (r=,440 p=0,001). But a weak correlation was found between MDAS and

STA-2 (r=,336 p=0,017) (**Table-1**).

Discussion

Dental procedures in patients may cause various mood changes. Changes in this mood affect the patient's application to the dentist for treatment, as well as the treatment and the course of treatment. This emotional change in patients not only causes a move away from treatment, but also prepares the ground for the deterioration of oral health [17]. In this study, dental fear and anxiety situations of patients admitted to our clinic and the effect of these conditions on periodontal tissues are compared.

Periodontitis is a chronic inflammatory disease that begins with the presence of a bacterial biofilm called dental plaque, which affects both the periodontal tissues and the bone surrounding the teeth [18]. Periodontal diseases can be found at any age in the

Table-1: Statistical Analysis Table

		Plaque Index	Bleeding Index	MAAS	Age	STAI-1	STAI-2	DFS	MDAS
Plaque Index	r	1,000	,293*	-,107	,001	,140	,040	,151	,342*
	p	.	,039	,462	,992	,332	,784	,296	,015
	n	50	50	50	50	50	50	50	50
Bleeding Index	r	,293*	1,000	,117	-,059	-,166	-,131	-,031	-,024
	p	,039	.	,418	,682	,249	,366	,831	,871
	n	50	50	50	50	50	50	50	50
MAAS	r	-,107	,117	1,000	,058	,459**	,630**	-,140	-,128
	p	,462	,418	.	,692	,001	,000	,333	,374
	n	50	50	50	50	50	50	50	50
Age	r	,001	-,059	,058	1,000	-,030	-,028	-,083	,062
	p	,992	,682	,692	.	,834	,848	,566	,671
	n	50	50	50	50	50	50	50	50
STAI-1	r	,140	-,166	-,459**	-,030	1,000	,755**	,531**	,440**
	p	,332	,249	,001	,834	.	,000	,000	,001
	n	50	50	50	50	50	50	50	50
STAI-2	r	,040	-,131	-,630**	-,028	,755**	1,000	,459**	,336*
	p	,784	,366	,000	,848	,000	.	,001	,017
	n	50	50	50	50	50	50	50	50
DFS	r	,151	-,031	-,140	-,083	,531**	,459**	1,000	,817**
	p	,296	,831	,333	,566	,000	,001	.	,000
	n	50	50	50	50	50	50	50	50
MDAS	r	,342*	-,024	-,128	,062	,440**	,336*	,817**	1,000
	p	,015	,871	,374	,671	,001	,017	,000	.
	n	50	50	50	50	50	50	50	50

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adult population. Epidemiological studies show that most adolescents and adults exhibit bleeding gums, and periodontal problems may occur following bleeding gums. Between 2009 and 2012, periodontal examinations with the use of full-mouth scans under the US National Health and Nutrition Examination Survey (NHANES) showed a prevalence of periodontal disease of 45.9%. Severe periodontitis alone is thought to affect about 11% of the population and become the sixth most common chronic disease in the world. In our study, it was observed that there was an increase in periodontal bleeding index in people with high periodontal plaque index.

Kunzelmann et al. [19] stated that the level of fear is stable with the increase in age, the level of fear that exists with the increase in visits to dentists gradually decreases or dental fear loses its importance with other health problems that develop in patients. Although the fact that the dental anxiety scores of younger age groups were higher than the scores of older age groups in Uslu Bozkurt et al. study [20] was consistent with Kunzelmann et al. study. Oktay et al. [21] did not find a significant difference in anxiety scores between age groups. In the studies of Muğlalı et al. [20] and Öcek et al. [14], there was no significant difference between the groups in terms of age. In our study, it was found that there was no correlation between age and Mindful Attention Awareness Scale (MAAS), Spielberger's State-Trait Anxiety Inventory (STAI-1, STAI-2), Dental Fear Survey (DFS), Modified Dental Anxiety Scale (MDAS), plaque index and bleeding index.

Considering the effect of age and education level on oral hygiene, it was limited in our study because it may affect the Mindful Attention Awareness Scale (MAAS) values. We do not think that these values affect plaque index and bleeding index values in our study. Since there was no previous study examining the relationship between conscious awareness and periodontal diseases in the literature reviews, there was no study to compare the data we obtained [1].

In determination of dental anxiety, there are anxiety scales for adults, different from children [22]. Today, Modified Dental Anxiety Scale (MDAS) and Dental Fear Survey (DFS) are among the frequently used scales to determine dental anxiety. These scales can help the physician in planning the treatment by determining the patient's anxiety levels [23,24]. Fırat et al.'s study showed that Dental Fear Survey (DFS) was reliable for the Turkish population and applicable to Turkish population [25]. In addition, the Modified Dental Anxiety Scale (MDAS) is easy and quick to complete, as well as includes questions about conventional treatment [26].

Uslu Bozkurt et al. [20] stated in their study that there was no significant relationship between periodontal status and dental anxiety, Kara et al. [27] and Sezer et al.'s [28] studies also support this. In our study, it was found that there was a statistically significant and positive low-power correlation between the plaque index and the Modified Dental Anxiety Scale (MDAS).

Conclusion

In our study we have tried to find out the relationship between mindfulness awareness, anxiety, dental anxiety and oral hygiene status in population. We tried to evaluate the psychological state of the patient in at least high school graduated, systemically and psychologically healthy individuals between the ages of 25-35 by using MAAS, Spielberger State-Trait Anxiety Inventory, MDAS and DFS tests. We evaluated plaque index and bleeding indices in periodontal examination. No correlation was found between the bleeding index and other indices. Also, no correlation was found between age and other indices. Although a correlation was observed between plaque index and MDAS, no correlation was observed between plaque index and other indices. As a result, we found that there was no correlation between the patient's psychological state and oral hygiene status. Dental anxiety is an important condition that is common worldwide and further research is needed.

Conflict of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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