




Evaluation of Dental Anxiety Levels on Oral and Dental Health Quality of Life in Patients with Hashimoto Thyroiditis

Ayşenur Güngör Borsöken¹ , Derya Gürsel Sürmeliöglü¹ , Songül Özdöğen^{1*} 

1. Department of Restorative Dentistry, Faculty of Dentistry, Gaziantep University, Şehitkamil, Gaziantep, Türkiye.

*Corresponding author: Özdöğen S. Department of Restorative Dentistry, Faculty of Dentistry, Gaziantep University, Şehitkamil, Gaziantep, Türkiye.
E-mail: ozdogens@gmail.com.

Abstract

Aim: This study aimed to evaluate the effect of anxiety level, dental fear, anxiety on oral health quality of life oral, and dental health in Hashimoto's thyroiditis patients.

Materials and Methods: Ninety adult individuals were included from Gaziantep University Faculty of Dentistry. All participants were asked about demographic parameters (age, gender), socio-economic status (education, marital status), and oral hygiene habits. The Oral Health Impact Profile-14 (OHIP-14) and oral health-related quality of life - United Kingdom (OHRQoL-UK) questionnaires were used to assess the effect of individuals' oral health on their quality of life. Dental anxiety levels were evaluated with the Modified Dental Anxiety Scale (MDAS). Statistical analysis was performed using IBM SPSS Statistics 22.0.

Result: There were no significant differences for Sociodemographic data, dental habits, age, marital status, educational status, smoking, frequency of brushing tooth, frequency of visiting the dental clinic in OHIP-14, OHRQoL, and MDAS survey scores ($p > 0.005$). However, there was a statistically moderate positive correlation between the total OHIP-14 scores and the MDAS scores ($r = 0.309$; $p < 0.003$). Additionally, a moderate negative correlation was shown between the total OHRQoL and the MDAS scale ($r = 0.307$; $p < 0.003$).

Conclusion: In conclusion, this study showed that patients' quality of life regarding oral and dental health was low, regardless of individual factors. It was found that dental anxiety was lower in patients with HT, and a significant correlation between the quality of life and anxiety level was observed.

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Keywords: OHIP-14, Hashimoto's thyroiditis, MDAS, OHRQoL-UK.

Introduction

Hashimoto's thyroiditis (HT) is one of the chronic autoimmune diseases. It is characterized by a variable degree of decreased thyroid function and elevated levels of thyroid peroxidase antibodies (anti-TPO) and thyroglobulin antibodies (anti-TG), as well as other thyroid antibodies and lymphocytic infiltration. The prevalence of the disease depends on factors such as gender, age (especially between 45-55 years), and race (more common in whites than in other races) (1). Hashimoto's disease primarily affects women and has a prevalence rate of 2% in our society. It is characterized by the progressive destruction of thyroid tissue, although the exact mechanism is not fully understood. Possible factors involved in its etiology include dietary iodine

intake, female gender, stress, smoking, alcohol, drug therapy (cytokine therapy and estrogens), bacterial (*Yersinia enterocolitica*) and viral infections, vitamin D deficiency, selenium deficiency, pregnancy, fertility, and age (2).

"Fear" and "anxiety" are terms that are often used interchangeably, though they refer to different experiences, but they have different meanings. Fear is a subjective feeling towards a known situation, whereas anxiety is the uneasiness towards an unknown situation, implying worry (3). Dental anxiety is an intense state of uneasiness that cannot be easily explained and is related to fear and anxiety associated with dental treatments (4). Despite recent developments in dentistry, anxiety and fear about dental treatments continue to be widespread in society (5). Dental anxiety, which causes patients to

avoid treatment during or just before dental procedures due to extraordinary expectations, is a significant issue that can negatively impact the treatment process (6). This anxiety, which includes emotional, somatic, and cognitive elements, leads to the deterioration of patients' oral and dental health and adversely affects their quality of life (7). The oral/dental cares of patients avoided regular dental check-ups and treatments due to anxiety gradually deteriorates, eventually leading to urgent treatment needs. It has been determined that the dental fear levels of these patients, who seek urgent care, may increase. As a result of the pain efficient, they may avoid dental treatments even more, creating a vicious cycle (8).

HT can significantly affect the quality of life of individuals, potentially impacting all areas of life. Bocchetta et al. report that there is a pathogenic effect between HT and mood disorders, and it is also suggested that there may be a link between thyroid diseases and cognitive decline (9).

Scales such as the MDAS, DAS, and Dental Fear Questionnaire (DKA) are used to determine levels of dental anxiety. These scales, which observe psychological and behavioral changes, allow individuals to assess themselves (10). The MDAS, a 5-question self-assessment scale developed by Humpris et al., with Turkish validity and reliability studies conducted by Tunç et al., is frequently used because it is short and cost-effective in population-based studies (11).

OHIP-14 scale is a specific one developed by Slade et al. (12) to comprehensively assess the effects of individuals' current oral and dental health on patients' health and quality of life. Slade reduced the original 49-question scale to 14 questions to facilitate its use in clinical settings. When compared with the original form, a validity of 94% was observed (13). Başol et al. carried on a validity and reliability study of this scale in Turkish. (14), and the Cronbach's alpha value was observed as 0.74.

OHRQoL is based on the World Health Organization's (WHO) "structure-function-ability-participation" model, which was renewed in 1998 and focuses on health and disease states (both positive and negative). It is a questionnaire developed in England by McGrath et al.(15). The questionnaire includes two some questions on symptoms, on physical condition, on psychological condition, and on social status. Mumcu et al. (16) was conducted of validation in Turkish people scale with Cronbach's was observed as 0.96.

OHIP-14 and OHRQoL-UK were used to assess the impact of individuals' oral health on their quality of life. Dental anxiety levels were measured with the

MDAS. The cut-off value of ≥ 13 was established to detect high dental anxiety.

The null hypothesis of the study was

- The level of dental anxiety is high in patients with Hashimoto's thyroiditis
- There is no correlation between HT patients' dental health and quality of life and their dental anxiety

Materials and Methods

Ethics Committee Approval

The study was initiated after obtaining both written and informed consent from the patients, prepared with the Helsinki Declaration and, approved by the Gaziantep University Ethics Committee (Ethics Committee Approval Date - No: 2020/281).

This study aimed to asses the general oral health of 90 participant over the age of 18 who applied to the Gaziantep University, Faculty of Restorative Dentistry Department, and who had no other systemic diseases, in order to make comparisons regarding dental anxiety.

Participants were provided with a questionnaire form that included sociodemographic questions in the first part. Demographic information was gathered about gender, body mass index, education status, reason for application, tooth brushing frequency, and frequency of dental check-ups. The lowest level of education recorded was literacy, while the highest was university education. To assess tooth brushing habits, responses were classified as never, irregular, once daily, or two or more times daily. Smoking habits, including whether the participants smoked and the daily amount if they did, were also assessed. The purpose of the questionnaire was to profile the individuals regarding their general condition, hygiene habits, and interest in oral health.

In the second part of the form used in our study, the OHIP-14 questionnaire was utilized to assess the oral hygiene profile, and the OHRQoL scales were used to assess quality of life, while the MDAS was employed to evaluate fear and anxiety. The OHIP-14 scale is a measurement tool consisting of seven dimensions. Each question was evaluated using a 5-point Likert scale (0: never, 1: rarely, 2: sometimes, 3: often, 4: always). These categories are addressed under separate headings: functional limitation (questions 1-2), physical pain (questions 3-4), psychological discomfort (questions 5-6), physical disability (questions 7-8), psychological disability (questions 9-10), social disability (questions 11-12), and handicap (questions 13-14).

The total score of the questionnaire is obtained by summing the points given to all questions. Scores on the

OHIP-14 scale range from 0 to 56, with higher scores indicating a lower quality of life related to oral and dental

health and an raise in severity of current symptoms

The MDAS was used to measure the level of dental anxiety. This scale consists of 5 questions, with scores ranging between 5 and 25. On this questionnaire, 1 point indicates "I feel comfortable," 2 points indicate "I feel slightly tense," 3 points indicate "I feel anxious," 4 points indicate "I feel anxious and distressed," and 5 points indicate "I am very scared; I feel changes in my body such as sweating.

The OHRQoL scale consists of 16 questions evaluated across 4 subscales: symptoms (2 questions), physical condition (5 questions), psychological condition (5 questions), and social condition (4 questions). A 5-point Likert scale is used to score this scale (Very bad effect = 1, Bad effect = 2, No effect = 3, Good effect = 4, Very good effect = 5). The lowest possible score on the scale is 16, while the highest possible score is 80.

Statistical Analysis

Statistical analysis of the data obtained from the study was performed using the IBM SPSS Statistics 22.0 (SPSS Inc., Chicago, IL, USA) program. The suitability of numerical variables for normal distribution was analyzed using the Shapiro-Wilk test. Since all variables were normally distributed, ANOVA tests were used for comparisons between groups. Comparisons of categorical data between groups were performed using the exact method of chi-square analysis. Relationships between

parameters were evaluated using the Pearson correlation test, with the significance level set at $p < 0.05$. The correlation coefficient was interpreted as follows: $r > 0.60$ was considered a high correlation, $r = 0.3-0.6$ was considered a medium correlation, and $r < 0.3$ was considered a low correlation.

Results

The study was conducted with 90 female patients aged between 20 and 60 years who had Hashimoto's thyroiditis. The age distribution was as follows: 33.3% were aged 20-30, 23.3% were aged 31-40, 23.3% were aged 41-50, and 20% were aged 51-60. Of the participants, 63 (70%) had a body mass index (BMI) above 25, indicating that the study focused on overweight and obese individuals. Additionally, 70% of the patients were either university graduates or currently in the process of obtaining a university degree. It was noted that 69 (76.7%) of the participants were non-smokers.

Sociodemographic factors and habits such as age, marital status, education level, frequency of tooth brushing, smoking, and frequency of visiting the dentist did not show significant differences in OHIP-14, OHRQoL, and MDAS questionnaire scores ($p > 0.005$) (Table 1).

Table 1: Sociodemographic and clinical findings (n, %) and p values between oral health-related quality of life scales scores (OHIP-14, OHRQoL, MDAS)

	Frequency (n)	Percentage (%)	OHIP-14 P	OHRQoL P	MDAS P
AGE					
20-30	30	33,3	p>0,05	p>0,05	p>0,05
31-40	21	23,3			
41-50	21	23,3			
51-60	18	20,0			
BMI					
Weak	3	3,3	p>0,05	p>0,05	p>0,05
Healthy Overweight Obese	39	43,3			
Weak	27	30,0			
Healthy Overweight Obese	21	23,3			
MARITAL STATUS					
Married	66	73,3	p>0,05	p>0,05	p>0,05
Single	24	26,7			
LEVEL OF EDUCATION					
Elementary	6	6,7	p>0,05	p>0,05	p>0,05
Primary education	9	10,0			
Secondary education	12	13,3			
University	63	70,0			
FREQUENCY OF CIGARETTES	(n)	(%)			
Yes	12	13,3	p>0,05	p>0,05	p>0,05
No	69	76,7			
Sometimes	9	10			
FREQUENCY OF VISITED TO DENTIST					
In the presence of a complaint	30	33,3	p>0,05	p>0,05	p>0,05
Once every three to five years	39	43,3			
1-2 per year	21	23,3			
FREQUENCY OF TOOTH BRUSING					
None	12	13,3	p>0,05	p>0,05	p>0,05
1 time per day	42	46,7			
2 times a day	36	40,0			

*p<0.05

The mean scores for the scales used in the study are presented in Table 2. There was a statistically moderate positive correlation between the Total OHIP-14 score and MDAS ($r = 0.309$; $p < 0.003$). Conversely, a moderate negative correlation was found between the Total OHRQoL score and the MDAS scale ($r = 0.307$; $p < 0.003$) (Table 3).

Table 2: Mean Values of Oral health-related quality of life questionnaire and Modified dental anxiety scale scores (OHIP-14, OHRQoL, MDAS) (Mean± Sd)

OHIP-14	MEAN ± SD
Functional limitati	1,60 ± 2,1
Physical pain	3,46 ± 1,9
Psychological discomfort	2,00 ± 2,1
Physical disability	1,93 ± 2,2
Social disability	2,10 ± 2,03
Psychological disability	1,40 ± 1,9
Handicap	1,40 ± 1,7
TOTAL	12,50 ± 10,5
OHRQoL	
Symptom	5,20 ± 2,4
Physical status	14,96 ± 4,9
Psychological status	14,40 ± 4,2
Social status	11,56 ± 3,2
TOTAL	34,56 ± 11,03
MODIFIED DENTAL ANXIETY SCALE	
MDAS 1	2,03 ± 1,1
MDAS 2	2,06 ± 1,8
MDAS 3	2,60 ± 1,2
MDAS 4	2,13 ± 1,25
MDAS 5	2,63 ± 1,4
TOTAL	11,46 ± 5,4

Table 3. OHIP-14 and OHRQoL correlation with MDAS

	MDAS1		MDAS2		MDAS3		MDAS4		MDAS5		TOTAL MDAS	
	r	p	r	p	r	p	r	p	r	p	r	p
OHIP-14												
Functional limitati	,456	0,000	,495	0,000	,185	0,081	,409	0,000	,332	0,001	,372	0,000
Physical pain	,481	0,000	,296	0,005	,232	0,028	,369	0,000	,229	0,030	,333	0,001
Psychological discomfort	,310	0,003	,145	0,174	-0,075	0,484	,281	0,007	,011	0,921	,113	0,290
Physical disability	,574	0,000	,469	0,000	,166	0,118	,527	0,000	,202	0,056	,370	0,000
Social disability	,325	0,137	,158	0,137	,051	0,632	,347	0,001	,124	0,246	,217	0,040
Psychological disability	,435	0,000	,282	0,007	,085	0,425	,328	0,002	,024	0,821	,199	0,060
Handicap	,646	0,000	,543	0,000	,254	0,016	,520	0,000	,274	0,009	,432	0,000
TOTAL	,520	0,000	,354	0,001	,114	0,285	,442	0,000	,165	0,120	,309	0,003
OHRQoL												
Symptom	-,205	0,053	-,056	0,603	,283	0,007	-,238	0,024	-,362	0,000	-,282	0,007
Physical status	-,450	0,000	-,226	0,032	,366	0,000	-,488	0,000	-,342	0,001	-,430	0,000
Psychological status	-,294	0,005	-,081	0,449	,175	0,099	-,213	0,044	-,151	0,156	-,198	0,062
Social status	-,411	0,000	-,239	0,023	,294	0,005	-,402	0,000	-,268	0,011	-,374	0,000
TOTAL	-,324	0,002	-,104	0,329	,272	0,010	-,350	0,001	-,268	0,011	-,307	0,003

*p<0.05

Discussion

Autoimmune thyroiditis, commonly known as Hashimoto's Thyroiditis, is a prevalent condition that increases in frequency with age. Comprehending the connection between anxiety and quality of life in patients with Hashimoto's Thyroiditis is crucial for both patients and healthcare providers. This study aimed to evaluate the relationship between dental anxiety and oral-dental health-related quality of life in patients with Hashimoto's Thyroiditis. Oral-dental health is a crucial aspect of maintaining overall well-being, and it has been clinically established that oral and general health mutually influence each other. (17), the evaluation of the effect of oral and dental health profile on general health quality of life is meaningful for this patient group, which has not been studied before. In our study, OHIP-14 was used to evaluate oral hygiene profile and OHRQoL scales were used to evaluate quality of life, while MDAS scale was used to evaluate fear and anxiety. Since both scales can detect relationships between different variables under the same domain, the use of OHIP-14 and OHRQoL questionnaire together contributed to the evaluation of different parameters.

In the study by Doğaner et al., a cut-off value of 15 was established for identifying high scores for dental anxiety. In contrast, Caltabiano et al. recommended a higher cut-off value of 19 for the same purpose (18).

Considering that dental anxiety levels in this patient group are expected to be lower compared to healthy individuals, the study by Tunç et al., which includes reliability/validity analysis of MDAS questionnaire, was used as a reference for determining the appropriate cut-off value (11).

According to this study, individual parameters such as marital status, age, education level, tooth brushing habits, smoking, BMI and visiting frequency the dentist did not influence the patients' quality of life concerning oral/dental health. This aligns with the study by John et al. (19) ., which also found that education and age did not significantly impact oral and dental health-related quality of life. However McGrath et al. (20) conducted in England to identify key parameter related to OHQoL, it was observed that age, socioeconomic status, and individual factors.

It was found that the average MDAS scores of patient in our study were below the cut-off value for dental anxiety levels. Ilguy et al. (21), the MDAS scale was administered to a group of Turkish patients, revealing a dental anxiety frequencies of 8.8%. In the study conducted using a different scale in individuals with thyroid disease, anxiety and depression levels were evaluated and no significant relationship was found between depression or anxiety and dentist anxiety (22). However, on the other study et al. were found that patients with autoimmune

thyroiditis were more likely to exhibit symptoms of depression and anxiety compared to healthy controls (23). The dental anxiety in individuals with autoimmune diseases studies are limited in the literature. The low average dental anxiety observed in our study may be attributed to the fact that 86.7% of individuals with Hashimoto's thyroiditis brush their teeth at least once a day, suggesting that patients who maintain good oral hygiene are less likely to experience traumatic dental procedures.

In our study, we found a moderately significant correlation between the anxiety scale and both the OHIP-14 and OHRQoL questionnaire. This result aligns with the findings of McGrath and Bedi, who conducted a study with 1800 participants and examined the effects of dental visit frequency, oral hygiene practices, and dental anxiety on OHRQoL in detail (20).

Despite numerous studies on OHRQoL across various populations, research specifically focusing on individuals with Hashimoto's thyroiditis (HT) remains limited. Our study is valuable in providing insights into dental anxiety and OHRQoL in a frequently encountered yet under-researched patient group.

For comparison, Azuma et al. (24) used the OHRQoL and OHIP-14 scales to assess the quality of life in Sjögren syndrome' patients, finding an average OHIP-14 score of 15.9. This suggested low quality of life according to the OHRQoL scale. Similarly, another study on primary Sjögren syndrome patients reported an average OHIP-14 score of 16.2 and low quality of life according to the OHRQoL scale (25). Salehi et al. found that individuals with thyroid disease had lower oral health-related quality of life compared to healthy individuals, highlighting the need for better periodontal and dental care. (26). De Pinho et al. (27) examined the impact of gum problems in diabetic patients using the OHIP-14 scale and found that gum issues negatively affected quality of life. In this study observed that the average OHIP-14 score was 12.50 and the average OHRQoL score was 34.56. Despite a good oral hygiene profile in individuals with HT, their scores was lower, which is consistent with the literature mentioned.

The both null hypothesis were rejected.

There are several limitations to our study. These include, the exclusive participation of women, and the lack of classification of participants based on their HT treatment status. However, the power analysis indicated that the sample size was adequate for diagnostic efficiency.

To fully grasp the connection between oral health and dental anxiety in individuals with Hashimoto's thyroiditis, further longitudinal studies are necessary.

Conclusion

In conclusion, this study showed that patients' quality. of life regarding oral/dental health was lower, regardless of individual factor. It was also found that dental anxiety was generally low among patients with HT, and there was a significant relationship between dental anxiety and quality of life.

Acknowledgments

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Conflict of Interest

There is no personal or financial conflict of interest between the authors.

Ethics Committee Approval

The study was initiated after obtaining written and verbal consent from the patients, prepared in accordance with the Helsinki Declaration and approved by the Gaziantep University Non-Interventional Clinical Research Ethics Committee (Ethics Committee Approval date - No: 2020/281).

Author Contributions

Conceptualization: GBA, GSD; Data Curation: GBA, GSD; Formal Analysis: GSD; Investigation: GSD, GBA, OS; Methodology: GSD, GBA; Supervision: GSD; Validation: GSD, GBA OS; Visualization: GSD, GBA, OS; Writing-Original Draft: GBA, GSD; Writing – Review & Editing: GSD, GBA, OS

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