INFLUENCE OF PROSTHETIC THERAPY ON ESTHETICS AND ORAL HEALTH-RELATED QUALITY OF LIFE

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ABSTRACT

Improving the oral health - related quality of life (OHRQoL) and orofacial esthetics plays an important role in prosthetic therapy.

Objective: To examine the impact of different prosthetic therapies and gender on the assessment of orofacial esthetics and oral health-related quality of life.

Subjects and methods: The study included subjects who were divided into three groups according to the type of prosthetic therapy: complete dentures wearers (30), removable partial denture wearers (29) and fixed restoration wearers (30). All participants completed the OHIP 14 and the OES orofacial esthetic scale questionnaires. The participants rated their oral health with the OHIP 14 questionnaire. A higher score indicates a lower OHRQoL. The OES questionnaire rated orofacial esthetics. A higher number of points indicates greater satisfaction with esthetics.

Results: There was no significant difference in the mean scores of individual domains and the total OHIP scores between the examined groups in the assessment OHRQoL and orofacial esthetics (p> 0.05). ANOVA showed that men with complete dentures significantly felt a higher level of physical pain (p<0.037) compared to the other two groups. Women showed a higher level of social disability compared to men (p <0.019). There was a significant difference between the gender in the assessment of tooth shape (p <0.006), and on the total score OES scale (p <0.034).

Conclusion: Different types of prosthetic therapy had no impact on OHRQoL and orofacial esthetics. Women showed a higher level of social disability and less satisfaction with orofacial esthetics compared to men.

Keywords: Prosthetic therapy, Orofacial esthetic, OHRQoL

Introduction

Improving oral health-related quality of life (OHRQoL) and orofacial esthetics plays an important role in prosthetic therapy. According to the World Health Organization, health is a state of complete physical, mental and social well-being rather than the absence of disease [1]. Oral health as an important part of general health and can affect the physical and mental health of every person, being closely related to the quality of life. Tooth loss, partial or complete, affects all the functions, chewing, swallowing, speech but also the esthetic appearance of an individual. Therapy of such patients can be considered successful only if it includes patient satisfaction [2,3]. Previous definitions of oral health did not include other values of the patient, his perception or the patient's expectations and the possibility of adaptation. According to the new definition, the basic elements of oral health are:

1. Illness and condition which indicates the severity or degree of progression of the disease including pain and discomfort.

2. Physiological functions related to the function of chewing, swallowing, speaking, smiling.

3. Psychosocial function refers to the relationship existing between oral and mental health, the interaction of an individual in a society without discomfort [4].

Other factors determining oral health are the genetic, biological, physical and social environment, a person's behavior and access to health care. Factors influencing the assessment of oral health in persons such as age, previous experience, income, ability to adapt and patient's expectations are moderating factors. According to the new definition provided by the FDI "Oral health is multifaceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex "[4].

There is a large number of questionnaires that measure the quality of life depending on oral health. One of them is the Oral Health Impact Profile (OHIP). This questionnaire is a multidimensional and the most commonly used questionnaire. This questionnaire provided a subjective assessment of the patient about his oral health and impact to the quality of life. In this way, it is possible to measure the subjective assessment of the patient about the presence of dysfunction, pain, discomfort, disability and handicap caused by certain conditions of the stomatognathic system [5-9]. Since it takes a long time to complete the original version of the OHIP questionnaire, which contains 49 questions, today the shorter versions of the questionnaire have been developed such as OHIP-14 [8,9].

As esthetics is not sufficiently covered by the OHIP questionnaire which is not suitable for assessing orofacial esthetics, an orofacial appearance questionnaire 10, Orofacial Esthetic Scale (OES) has been developed measuring only the patient's orofacial esthetics and assesses the overall patient's satisfaction with esthetic appearance [10,11]. Prosthetic therapy re-establishes the impaired oral function but also the esthetic appearance of the patient. Prosthetic restorations used in the therapy of complete, partial edentulousness or tooth damage should be matched in color and shape with the gingiva, lips, smile as well as the patient's face. That is why the esthetic appearance of the patient is very important factor and the most common reason why patients need prosthetic therapy. Therefore, orofacial esthetics plays very important role in prosthetic therapy in accepting prosthetic restoration and patient adaptation. Previous studies have shown that the OES instrument is most often used for self-evaluation of orofacial esthetics [12].

Objective: The objective of this study was to examine the impact of different prosthetic therapies and gender on the assessment of orofacial esthetics and oral health-related quality of life.

Subjects and methods

The study included 89 patients from the Department of Prosthodontics and Dental Implantology, Faculty of Dentistry at the Sarajevo University. The sample included subjects of either gender, different age. This research was approved by the Ethics Committee of the Faculty of Dentistry with the Clinics of the University of Sarajevo. All participants were informed about the purpose of the research and signed an informed consent form.

According to the type of prosthetic therapy the participants were divided into three groups:
- complete dentures wearers (30),
- removable partial dentures wearers (29)
- and fixed restorations wearers (patients with single crowns or bridges in one or both jaws) (30).

All participants completed the OHIP 14 questionnaire [8,9] and the OES orofacial esthetic scale questionnaire [11,13,14]. The questionnaires also contained data on the age, gender and type of prosthetic restoration that the patient wears.

The participants rated their oral health with the OHIP 14 questionnaire by answering questions that were ranked from 0-4 on the Likert scale (0-never, 1-almost never, 2-occasionally, 3-quite often, 4-very often).

OHIP-14 contains seven domains that allow assessing the impact of oral health to the quality of life such as functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. The total OHIP 14 score can be from 0-56. A higher score indicates a lower OHRQoL.

The second questionnaire is the OES Orofacial Esthetic Scale questionnaire, which participants completed rating their orofacial esthetics on a scale from 1-5 (1=completely dissatisfied; 5=completely satisfied), containing eight questions related to the appearance of the lower third of the face and teeth. A higher score indicates greater satisfaction with esthetics.

Statistical methods of data analysis

Statistical analysis of the data was performed using IBM SPSS Statistics v.21 software. Descriptive statistical analysis included the arithmetic means, standard deviations and ranges of min-max values on quantitative variables were calculated, followed by absolute and relative frequencies on nominal variables. The study presents parametric methods, student t-test for testing two independent samples and one-factor analysis of variance (ANOVA) for testing three independent samples. The level of significance was $p < 0.05$.

Results

In this study 89 patients, 29 (32.6%) men and 60 (64.7%) women, were included. The average age of men was 63±10 years while of women 57±11.5 years. Participants in the study were approximately equally represented in the groups according to the type of prosthetic therapy (complete dentures n = 30, removable partial dentures n = 29, fixed restorations n = 30) (**Table 1**).

Table 2. shows the mean values of scores for all seven domains of the OHIP questionnaire and the

Table 1. Type of prosthetic therapy in relation to the gender of the participants included in the study							
		Man		**Woman**		**Total**	
		n	%	n	%	n	%
Type of prosthetic therapy	Complete denture	11	37,9	19	31,7	30	33,7
	Removable partial denture	11	37,9	18	30,0	29	32,6
	Fixed restoration	7	24,1	23	38,3	30	33,7
	Total	29	100,0	60	100,0	89	100,0

Table 2. The influence of the type of prosthodontic therapy on OHIP Score - OHIP-14 scores in the overall study sample

OHIP	Type of prosthetic therapy	n	Mean	S.D.	S.E.	min	max	F	p
Functional limitation	Complete denture	30	1,03	1,25	0,23	0	4		
	Removable partial denture	29	1,07	1,51	0,28	0	4	0,635	0,533
	Fixed restoration	30	0,70	1,42	0,26	0	5		
	Total	89	0,93	1,39	0,15	0	5		
Physical pain	Complete denture	30	2,30	2,12	0,39	0	8		
	Removable partial denture	29	1,55	1,59	0,30	0	6	2,916	0,060
	Fixed restoration	30	1,13	1,93	0,35	0	8		
	Total	89	1,66	1,94	0,20	0	8		
Psychological discomfort	Complete denture	30	2,23	2,25	0,41	0	8		
	Removable partial denture	29	1,83	2,07	0,38	0	7	1,720	0,185
	Fixed restoration	30	1,27	1,72	0,31	0	6		
	Total	89	1,78	2,04	0,22	0	8		
Physical disability	Complete denture	30	1,97	2,33	0,42	0	8		
	Removable partial denture	29	1,48	2,18	0,40	0	8	2,363	0,100
	Fixed restoration	30	0,80	1,71	0,31	0	8		
	Total	89	1,42	2,12	0,23	0	8		
Psychological disability	Complete denture	30	1,63	2,34	0,43	0	8		
	Removable partial denture	29	1,34	2,24	0,42	0	8	0,772	0,465
	Fixed restoration	30	0,93	1,98	0,36	0	8		
	Total	89	1,30	2,19	0,23	0	8		
Social disability	Complete denture	30	0,73	1,78	0,33	0	8		
	Removable partial denture	29	0,34	1,52	0,28	0	8	0,564	0,571
	Fixed restoration	30	0,77	1,76	0,32	0	7		
	Total	89	0,62	1,68	0,18	0	8		
Handicap	Complete denture	30	1,13	2,00	0,36	0	8		
	Removable partial denture	29	0,62	1,59	0,29	0	7	0,828	0,441
	Fixed restoration	30	0,67	1,47	0,27	0	6		
	Total	89	0,81	1,70	0,18	0	8		
OHIP Total score	Complete denture	30	11,03	11,34	2,07	0	46		
	Removable partial denture	29	8,24	10,26	1,91	0	43	1,467	0,236
	Fixed restoration	30	6,27	10,84	1,98	0	46		
	Total	89	8,52	10,89	1,15	0	46		

n — sample size   **Mean** — Arithmetic mean   **S.D.** — Standard deviation   **S.E.** — Standard sample error   **Min** — minimum values
Max — Maximum value   **F** — value of the F test   **p** — probability of rejecting the null hypothesis with 95% confidence level

Table 3. The influence of the type of prosthodontic therapy on OES score - mean values of the scores of the questions from the OES questionnaire and the mean value of the total OES scores depending on the type of prosthetic therapy

OES	Type of prosthetic therapy	n	Mean	S.D.	S.E.	min	max	F	p
OES 1	Complete denture	30	4,07	1,14	0,21	1	5		
	Removable partial denture	29	4,17	0,97	0,18	2	5	0,070	0,932
	Fixed restoration	30	4,13	1,17	0,21	1	5		
	Total	89	4,12	1,09	0,12	1	5		
OES 2	Complete denture	30	3,93	1,28	0,23	1	5		
	Removable partial denture	29	4,17	1,00	0,19	2	5	0,320	0,727
	Fixed restoration	30	4,07	1,14	0,21	1	5		
	Total	89	4,06	1,14	0,12	1	5		
OES 3	Complete denture	30	3,97	1,27	0,23	1	5		
	Removable partial denture	29	4,17	0,97	0,18	2	5	0,435	0,636
	Fixed restoration	30	3,90	1,16	0,21	1	5		
	Total	89	4,01	1,13	0,12	1	5		
OES 4	Complete denture	30	3,80	1,40	0,26	1	5		
	Removable partial denture	29	4,07	1,19	0,22	1	5	0,402	0,670
	Fixed restoration	30	3,83	1,15	0,21	1	5		
	Total	89	3,90	1,24	0,13	1	5		
OES 5	Complete denture	30	4,10	1,18	0,22	1	5		
	Removable partial denture	29	4,21	1,24	0,23	1	5	0,116	0,891
	Fixed restoration	30	4,23	0,97	0,18	1	5		
	Total	89	4,18	1,12	0,12	1	5		
OES 6	Complete denture	30	4,10	1,30	0,24	1	5		
	Removable partial denture	29	4,24	1,02	0,19	2	5	0,117	0,890
	Fixed restoration	30	4,17	1,02	0,19	1	5		
	Total	89	4,17	1,11	0,12	1	5		
OES 7	Complete denture	30	4,07	1,05	0,19	1	5		
	Removable partial denture	29	4,21	0,94	0,17	2	5	0,292	0,748
	Fixed restoration	30	4,00	1,17	0,21	1	5		
	Total	89	4,09	1,05	0,11	1	5		
OES 8	Complete denture	30	4,10	1,27	0,23	1	5		
	Removable partial denture	29	4,14	0,99	0,18	2	5	0,028	0,972
	Fixed restoration	30	4,17	0,99	0,18	1	5		
	Total	89	4,13	1,08	0,11	1	5		
OES Total score	Complete denture	30	32,13	8,00	1,46	14	40		
	Removable partial denture	29	33,38	7,38	1,37	16	40	0,209	0,812
	Fixed restoration	30	32,50	7,39	1,35	8	40		
	Total	89	32,66	7,53	0,80	8	40		

n — sample size   **Mean** — Arithmetic mean   **S.D.** — Standard deviation   **S.E.** — Standard sample error   **Min** — minimum values
Max — Maximum value   **F** — value of the F test   **p** — probability of rejecting the null hypothesis with 95% confidence level

mean values of the total OHIP scores for complete dentures wearers (CD), removable partial dentures wearers (RPD) and fixed restorations wearers (FR). Complete dentures wearers had on average a higher score for the domains of physical pain, psychological discomfort, physical disability and the mean total score compared to the removable partial dentures and fixed restorations wearers. However, the results of one-way ANOVA tests showed that the difference in mean scores between individual domains as well as the total OHIP scores between CD, RPD and FR wearers was not significant (p= 0,236).

Table 3. shows the mean values of scores for individual questions from the OES questionnaire and the mean value of the total OES scores depending on the type of prosthetic therapy. The mean values of scores for individual questions related to orofacial esthetics were high in all three groups of participants. The results of the one-way ANOVA test showed that there was no significant difference between the mean values of scores for individual questions from the OES questionnaire and the mean values of the total OES scores (p = 0.812) (Figure 1.) between CD, RPD and FR wearers. Analysis of the influence of gender on

OHRQO student t-test of independent samples revealed a statistically significant (t = -2,403, p <0,019) difference between the participants' gender in terms of social disability on the OHIP scale where woman showed a higher level of social disability (Mean=0,83) compared to men (Mean=0,17). ANOVA showed that men with CDs felt a higher level of physical pain (F=3,75, p <0.037) compared to men with RPD and FR. A statistically significant difference between the genders was in the assessment of tooth shape, where women rated tooth shape significantly less than men (p <0.006). The difference in the mean value of the total OES questionnaire scores between men (34.90 ± 6.14) and women (31.58 ± 7.94) was significant (p <0.034).

Discussion

Prosthetic therapy can be completely successful and complete only if, in addition to compensating for the lost tissues and functions, it has improved the quality of life and esthetic appearance of the patient. Numerous studies have proven that prosthetic therapy improves the quality of life [2,3, 13-16]. In this study, patients with different
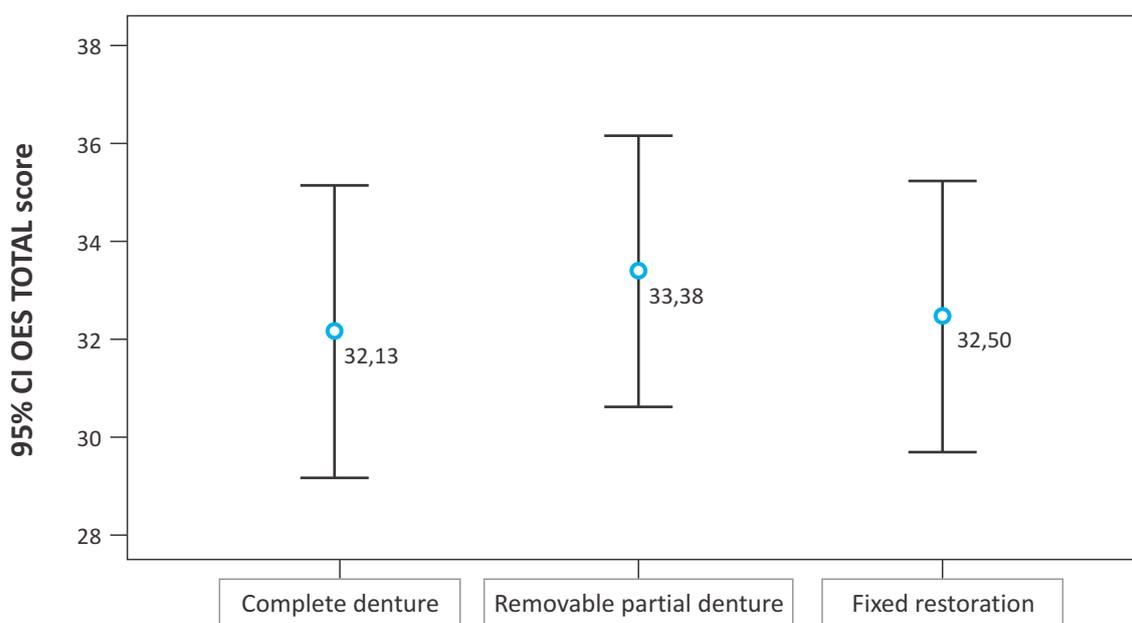

Figure 1. OES TOTAL score - mean value of the total OES score depending on the type of prosthetic therapy

prosthetic treatments, CD, RPD, and FR rated the oral health-related quality of life with the OHIP-14 questionnaire and satisfaction with the esthetic appearance of OES.

The results showed that in the evaluation of individual domains, complete denture wearers had a higher mean value of scores for physical pain, psychological discomfort and physical disability, and the total OHIP scores compared to wearers of removable partial dentures and fixed restoration. This indicates that the feeling of pain, reduced efficiency of chewing, speech and discomfort have affected the reduction of the quality of life in such persons. However, the difference between the mean values of all domains of the OHIP questionnaire as well as the mean values of the total OHIP scores was not significant between the examined groups. The reason for this is the small sample in this study and the large inter - individual variation being reflected in the high standard deviation. Physical pain, social disability and psychological discomfort are more present in wearers of complete dentures [2,17]. It has been proven that the domain of physical pain in CD wearers has the greatest impact to reducing the quality of life [18]. Numerous studies have shown that significantly lower values of the total OHIP scores indicate that patients are satisfied with the quality of life after prosthetic therapy, which is in accordance with the number of OHIP scores in this study [13, 15, 16, 18-20]. After conventional prosthetic treatments, quality of life, satisfaction and masticatory functions are improved. The improvement was greater in wearers of fixed than partial dentures but the least in wearers of complete dentures as proved in the study by Palomares et al. [19]. According to previous studies, after prosthetic treatment of CD, RPD and FR patients were satisfied with the quality of life [21, 22, 23]. Shaghaghian et al. stated that RPD wearers had the most present physical pain and physical disability and had to break off the meal [24]. Significant reduction of OHIP score, improvement of esthetics and masticatory effect was presented in patients who were previously wearers of conventional RPD and then treated with implant-supported partial dentures after one year [25]. Esthetics is an important factor in accepting all prosthetic restorations. In this study, scores on all eight questions were high in all three groups as well as the mean value of the overall OES score. The difference between the mean values of the total score for the examined groups was not significant indicating that all participants were satisfied with their appearance regardless of the type of prosthetic replacement (Figure 1). Also, these results may be explained by a small number of participants. Previous studies have indicated the patient's satisfaction with orofacial esthetics after prosthetic therapy [12-14,26,27]. However, when the gender influence was observed, the results showed that women with prosthetic restorations showed a higher level of social disability as a discomfort in society compared to men, and this, in turn, affected their quality of life. Women were less satisfied with the shape of the teeth and orofacial esthetics compared to men. Personal assessment of esthetics and the quality of life is influenced by numerous factors, such as gender, education, cultural environment, social norms, place of residence [17,21,28,29]. The results of the previous study showed significantly lower OHIP 14 score and higher OES score after all types of treatments - conventional CD, RPD, FPD and implant-supported CD, RPD and FPD as well as masticatory efficacy. However, CD wearers had the highest OHIP score after treatment. RPD wearers had the lowest OES score [13]. Mean values of total OES score were higher in CD wearers than in CD wearers in the upper and RPD in the lower jaw Kennedy Class I, which does not correspond to the findings of this study [14]. John et al. have stated in their studies that OHIP contains only four dimensions-Oral Function, Oro-facial Pain, Oro-facial Appearance and Psychosocial Impact which represent the basis for measuring the impact of oral health and the impact of therapy to the patient's satisfaction [30, 31]. The limitation of this study was a small sample, large inter-individual variation, as well as different prosthetic status in the antagonistic jaw.

Conclusion

Different types of prosthetic therapy had no impact on OHRQoL and orofacial esthetics. Women showed a higher level of social disability and less satisfaction with orofacial esthetics compared to men.

There is no conflict of interest.

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