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THE IMPACT OF ORAL HEALTH ON QUALITY OF LIFE IN PARTIALLY EDENTULOUS PATIENTS BEFORE AND AFTER PROSTHODONTIC REHABILITATIONS

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Abstract

The main goal of dental treatment and care is to help patients of reaching an acceptable level of satisfaction with their dentition and quality of life in general. The aim of this study was to estimate the Oral Health-Related Quality of Life (OHRQoL) before and after a prosthodontic rehabilitations in partially edentulous patients.

60 partially edentulous patients, treated with fixed and mobile dentures, go through extra oral and intraoral examination and completed a specific questionnaire before and 6 months after the treatment. The questionnaire was used to collect information on patient oral health-related quality of life, including anamnestic data, symptoms of ill-functioning, dental abilities and personal satisfaction. The patients were divieded in three identical groups as follows: group 1 - patients treated with fixed dentures, group 2 - patients treated with mobile dentures, and group 3 - patients treated with both fixed and mobile dentures. The data analyses were based on the respondents in the questionnaires and calculated using Statistical Package for the Social Sciences (SPSS) for Windows version 23. A p-value < 0.05 was considered as statistically significant.

Six months after the prosthodontic treatment all subjects establish significant improvements in Oral Health Impact Profile (OHIP) scores. Prosthodontic therapy was strictly associated with better OHRQoL values in all three groups, especially in Group 1, followed by Group 3 and less in Group 2.

The results demonstrated that prosthodontic rehabilitation in partially edentulous patients was associated with an improvement in patients' OHRQoL, which suggested increased levels of patient satisfaction.

***Key words**: Dentures, Oral health, Prosthodontic rehabilitation, Quality of life, Satisfaction.*

1. Introduction

The main goal of dental treatment and care is to help patients of reaching an acceptable level of satisfaction with their dentition and quality of life in general [1 - 3]. Because this conditions are not life threatening, a little attention has been given to dental health.

Many researchers still ignore the effects of the oral cavity and teeth on general health condition [4]. Nevertheless, the need to examine the influence of dental health on quality of life has been progressed considerably over the last decades [5 - 7]. Many studies report the impact of dental condition on social activities, like attending of a school, ability to work and realization of daily routine [1, 8]. It is sure that dental problems affect patients' personal satisfaction on esthetic and functional level [9, 10].

Some authors like Strauss and Hunt, [11], confirm that dental diseases and subsequent prosthodontic therapy have influence on patients' opportunity to live comfortably, to enjoy life, stay positive and be successful on personal and professional level. Different factors, such as eating, laughing, pain, taste sense, speech ability and appearance, have influence on patients' oral satisfaction and his Quality of Life (QoL) [12, 13].

To evaluate the outcome of a dental therapy we have to consider four parameters: biologic and physiologic characteristics (health of oral cavity and teeth, chewing, nutrition, esthetics), longevity (of teeth and prosthodontic restorations), psychological and social features (self-confidence, quality of life, personal satisfaction from dental treatment) and financial parameters [14].

The connection among disease and health is of great practical and theoretical significance. Although health and diseases are individual dimensions that could be analyzed apart, they are also frequently overlapped [15]. According to Locker, [16], disease is only one of

many harmful factors affecting health but also pathological condition may not necessarily influence on patients' poor health.

The most frequently models that consider disease and health are the biomedical and biopsychosocial model [17]. The biomedical (naturalistic) model of health has a pathogenic view (WHO ICIHD 1980), while the biopsychosocial (humanistic) model is established on promotion of well-being (Antonovsky [18], Berg *et al.*, [19]).

According to WHO, health is defined not in terms of the absence of disease, but in terms of optimal functioning and social and psychological well-being. Consequently, it was moved from a concern with disease to a concern with health and more over from curing disease to prevention and health promotion, giving great importance on the physical and social environments in which we live as big factors of health status. On the contrary, disease was defined as "pathological processes which (along with injury and developmental anomaly) affect the biological and functional integrity of the body". This definition supports the biological concept which refers to bodies, systems and tissues, and keep his interest in etiological agents, physiological parameters and clinical outcomes [16].

The definition for oral health from WHO 2000 is based on biopsychosocial model is "Oral health is well-being of the oral cavity, including the dentition and its supporting structures and tissues – the absence of disease and the optimal functioning of the mouth and its tissues, in a manner which preserves the highest level of self-esteem and inter-professional relationship" [20].

Yewe-Dwyer, [21], defined oral health in the following way: "Oral health is a state of the mouth and associated structures where disease is contained, future disease is inhibited, the occlusion is sufficient to masticate food and the teeth are of a socially acceptable appearance".

Quality of life is a multiplex concept used in many social and medical science studies. The debate about quality of life goes back to Plato and Aristotle (cited from Vitterso, [22]). This term appeared in professional literature for the first time in 1970 and reviewed by a scientific journal Social Indicators Research. Later, a multidisciplinary Journal of Happiness Studies describes the two main starting points for happiness: 1) the theoretical views of the good life, and 2) empirical research on subjective well-being [23]. The phrase health-related quality of live (HRQoL) was design to define the use of the term quality of life in medical contexts (Erikson, [24]) and to distinguish health and health-related quality of live. Poor health can influence on quality of life, but not necessary. It is presume that health problems are related with poor quality of life, but this is denied by many people with chronic disorders who assess their quality of life as better than healthy individuals [25].

Oral health-related quality of life (OHRQoL) is a multidimensional concept that characterizes an individuals' perception of how oral health impact on his quality of life and well-being [14]. There is a growing interest in OHRQoL in the past two decades from health professions, psychologists and sociologists [26]. They created different instruments to measure quality of life and oral health related quality of life. Many factors, such as: age, diseases, bad habits like alcohol and tobacco consummation, tooth loss [27], dental problems, prosthesis wear [28], cultural, sociodemographic, educational, financial [29], psychological and nutrition factors, have influence on OHRQoL.

There is an association between the number of natural teeth and OHRQoL. It has been described that individuals with fewer teeth and increasing age have negative effects on OHRQoL, at the same time increasing age alone is related with less negative effects on OHRQoL [30 - 32].

Some studies conducted that totally edentulous patients described worse quality of life due to difficulty in chewing, speech problems, physical pain and aesthetic dissatisfaction. In order to replace the missing teeth in totally and partial edentulous patients, different therapy modalities have been suggested [33].

2. Materials and Methods

A total of 60 subjects were conducted in this study, divided in three identical groups as follows: group 1 - patients treated with fixed dentures, group 2 - patients treated with mobile dentures, and group 3 - patients treated with both fixed and mobile dentures. The study was conducted on patients attending private dental office in Stip, Macedonia. The selection of the patients was done using the criteria of previously diagnosed need of prosthodontic therapy, consequently with fixed dentures, mobile dentures or their combination. Most of the patients had no previous experience with this kind of restorations.

The first group included 20 patients treated with fixed dentures covering at least 50% in one jaw. The second group also included 20 patients, which were treated with mobile dentures. Among these patients, 10 were treated with partial mobile denture both maxillary and mandibular, and 10 patients were treated with both total dentures. The participants from the third group were 20 patients treated with both fixed and mobile dentures in at least one jaw. All of the fixed dentures were ceramic fused to metal and made by two dentists and two different technicians.

A specific questionnaire was used to collect information on patient oral health-related quality of life, including anamnestic data, symptoms of ill-functioning, extra oral and intraoral examination, dental abilities and personal

satisfaction. The instrument we used to assess the oral health related quality of life was OHIP questionnaire. It is a 5-point Likert scale (never = 0, seldom = 1, sometimes = 2, fairly often = 3, and very often = 4) composed of 49 questions that consists seven different parts which comprise different aspects of oral self-rated and satisfaction: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. The overall OHIP was calculated and the total score point to the degree of oral health satisfaction with higher score indicating poorer OHRQoL. The patients were examined before and 6 months after the treatment.

The data analyses were based on the respondents in the questionnaires and calculated using Statistical software SPSS for Windows version 23. A p value < 0.05 was considered as statistically significant.

3. Results and Discussion

3.1 Results

For the purpose of this study, 60 patients were randomly selected and examined before and six mounts after the treatment.

From the total number of participants 33 were females (n = 33), and 27 were males (n = 27). Females were dominant in Group 1 and Group 3, while Group 2 had more male participants (Table 1).

The average patient age was 51.9 ± 9.69 years. The first group, patients treated with fixed dentures included the youngest participants. Here, the range was from 35 to 65 years or average 45.3 ± 10.71 years. In the third group, patients treated with both fixed and mobile dentures, conducted a little bit older participants with range from 40 to 59 years (average 51.6 ± 5.50 years). The oldest patients participate in the second group and were treated with mobile dentures (range from 47 to 71, average 58.8 ± 7.49). (Table 1).

Level of education was registered for all participants. From the total number of subjects 40% were with faculty, 35% with finished high school, and only 25% with finished primary school. Less educated were dominant in the Group 2 (Table 1).

The results of extraoral examination showed that "old aged look" appeared in all patients in Group 2, 16 patients (80%) in Group 3 and only 2 subjects (10%) from Group 1.

Intraoral examination consisted teeth that need to be extracted, teeth that need to be repaired because of decay and subjects without specifics. In Group 1 only 2 participants had to undergo tooth extraction, none in Group 2, while in Group 3 there were 7 patients with need of tooth extraction. Similar situation was with tooth decay, in Group 1 there were 9 participants with need of repair, none in Group 2 and 11 subjects in Group 3 (Table 2).

The OHIP scores for all patients are showed in Table 3, together with statistical significance before and after six months of prosthodontic treatment. Mean OHIP score was higher in all groups when comparing before and after therapy. The most affected domain in all three groups was "functional limitation". Before treatment biggest values were recorded in Group 2 - 148, followed with Group 3 - 124 and lowest OHIP score in Group 1 - 87. The most frequently problems registered by all patients were chewing difficulties, physical pain and psychological and social disability.

As we expected, six months after the prosthodontic treatment, mean scores of all seven parts together with the total scores were significantly lower. There was a significant difference ($p < 0.05$) between OHIP scores in the three groups before and after treating patients with dentures. Prosthodontic therapy was strictly associated with better OHRQoL values in all three groups, especially in Group 1, followed by Group 3 and less in Group 2 (Table 3).

Table 1. Description on the participants' gender, age and education

Participants (n = 60)			
(number) %	**Group 1**	**Group 2**	**Group 3**
Gender			
Female (33) 55%	13	8	12
Male (27) 45%	7	12	8
Age	35 - 65	47 - 71	40 - 59
Average	45.3	58.8	51.6
SD	10.71	7.49	5.5
Education			
Primary school (15) 25%	4	9	2
High school (21) 35%	6	8	7
Faculty (24) 40%	10	3	11

Table 2. Description on participants' extraoral and intraoral clinical examination

Number of participants (n = 60)			
	Group 1	**Group 2**	**Group 3**
Extraoral examination			
"Old aged look"	2	20	16
Normal	18	0	4
Intraoral examination			
Teeth to be extracted	2	0	7
Teeth with decay	9	0	11
Without specifics	9	0	2

Table 3. Main OHIP scores examined before and 6 months after the prosthodontic treatment

Main OHIP scores examined before and 6 months after the treatment									
Parameters	1 group - before treatment	1 group - after treatment	p	2 group - before treatment	2 group - after treatment	p	3 group - before treatment	3 group - after treatment	p
Functional limitation	23	4	0,.000000144	29	10	0.00000000473	27	6	0.00000000175
Physical pain	16	2	0,.00000161	24	5	0.00000000713	23	10	0.000000662
Psychological discomfort	11	2	0.00000213	16	7	0.000021	15	5	0.0000871
Physical disability	11	1	0.000000426	28	14	0.00000497	20	6	0.0000000616
Pscyhological disability	8	0	0.0000000192	19	8	0.0000194	13	6	0.0000000011
Social disability	9	2	0.0000000233	13	7	0.00000521	9	4	0.001812
Handicap	9	1	0.0000000832	19	12	0.000339	17	7	0.0000871
Total OHIP	**87**	**12**	0.000296	**148**	**63**	0.000488	**124**	**44**	0.0006

3.2 Discussion

This study was based on data collected from randomly selected patients who attend the dental clinic in Stip asking for prosthodontic treatment using clinical examination and self-reported questionnaires. The extraoral and intraoral clinical examination was carried out by two dentist using a mirror and a probe. Radiographs were used only in cases where extraction was necessary. The intraoral examination included recording the number of teeth to be extracted and teeth with dental caries. A tooth was registered as decayed if caries was extended into the dentin. In order to assess OHRQoL we used OHIP questionnaire that is reliable and widely used in many countries. Furthermore, the questionnaire was done before and six months after the prosthodontic therapy.

In the present study, we had more female participants than male and they reported poorer OHRQoL than man. Although, males dominant in the group of totally edentulous patients, they reported better OHRQoL than women. Similar results are gain in other studies [34]. Probably, this is because woman take more care about their appearance, including oral health and have bigger aesthetic needs.

The average age of the participants in our study was 51.9 ± 9.69 years. The oldest patients participate in the second group, were totally edentulous and consequently treated with mobile dentures. (58.8 ± 7.49). Due to total loos of the teeth this patients reported the poorer OHRQoL compared to the other two groups. The difference was statistically significant.

The association between education and oral health related quality of life reported that subjects with higher education reported better OHRQoL [35, 36]. Less educated participants were dominant in Group 2 and reported poorer OHRQoL, even though the difference was not statistically significant.

Results of this study showed that mean OHIP score in all three groups was significantly bigger before treatment. Biggest scores before treatment were recorded in Group 2 as we expected. Functional limitation was the most frequently reported oral problem in Group 2, followed by physical disability and physical pain. Six months after the therapy with mobile dentures the participants showed better OHIP scores. The total score has changed from 148 before to 63 after the treatment. The subjects reported better oral health related quality of life after the treatment and the difference was statistically significant ($p < 0.05$; $p = 0.000488$) consequently have changed the more affected values - functional limitation from 29 to 10 ($p < 0.05$; $p = 0.00000000473$); Physical disability from 28 to 4 ($p < 0.05$; $p = 0.00000497$); Physical pain from 24 to 5 ($p < 0.05$; $p = 0.00000000713$).

Better results were registered in Group 3, where the participants were treated with combination of mobile and fixed dentures. Initial mean OHIP score before treatment in this case were lower than Group 2 and after six months changed from 124 to 44, showing statistically significant difference ($p < 0,05$; $p = 0,0006$).

Moreover, the study presented similar results as other researchers [3]. Patients treated with fixed dentures had the least negative effects of the tested features, where basic mean OHIP score was 87 and six months after the prosthodontic treatment changed to mean OHIP score of 12. There was a statistically significant difference ($p < 0.05$; $p = 0.000296$).

4. Conclusions

- This study evaluate a connection between the dental condition, quality of oral health in patients of different gender, age and education and consequently treated with different prosthodontic modalities (fixed, mobile and combined dentures).

- The results of this research study shown that there are no statistically significant difference in line with gender although female participants reported poorer OHRQoL than man. Possibility for this result is that woman generally take more care about their appearance. Considering the participants age in the study older subjects reported poorer OHRQoL and that was statistically significant. This is due to totally loos of the teeth which subsequently causes worse results. Although, the difference was not statistically significant, level of education is associated with OHRQoL. More educated participants reported better OHRQoL and were treated usually with fixed or combined dentures. For treatment with mobile dentures dominate less educate subjects, that indicates their low oral hygiene and oral health culture.

- As we expected, six months after the prosthodontic treatment, mean scores of all seven parts together with the total scores were significantly lower. There was a significant difference ($p < 0.05$) between OHIP scores in the three groups before and after prosthodontic rehabilitation. Prosthodontic therapy was strictly associated with better OHRQoL values in all three groups. Furthermore, analyses showed that the patients treated with fixed dentures (Group 1) suffered least negative effects of the tested features, followed by the patients treated with mobile and fixed dentures (Group 3), and finally participants treated with mobile dentures (Group 2).

- Our study had some limitations. First of all, it was conducted on a small number of randomly selected participants. In order to get more relevant results the number of patients in all three groups should be increased. Furthermore, as instrument to collect data we used a questionnaire which has no protection on the participants responses. The ambient where the questionnaire was filled may have influence on the responses. Since the OHIP questionnaire was answered in dental clinic and in front of a dentist may have influenced on the final result.

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