

Oral Health Related Quality of Life (OHRQoL) in Patients Wearing Fixed Partial Dentures

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ABSTRACT

The objective of this longitudinal study was to find out patients self-perception about their oral health condition before treatment, one week and one year after the prosthodontics treatment with fixed partial dentures (FPD) as well as to compare the outcomes with healthy patients, by identifying the changes in relevant aspects of quality of life. A total of 70 subjects – 35 with necessity of fixed partial dentures (FPD) and 35 healthy individuals without any need for prosthetic treatment as a control group (CG) participated on a voluntarily base by responding the OHIP – MAC49 questionnaire for determining the oral health related quality of life (OHRQoL). The FPD group responded in three time intervals – before the FPD intervention, one week after and finally, one year after it. In order to examine the extent in the improvement of the self-rated quality of life, these three measures taken over different periods of time were compared. This set of three assessments from the FPD group was also compared with the average scores of the CG. The results have shown very fast improvement in almost all domains of OHRQoL defined by the instrument after applying FPD. The overall mean of experienced or perceived difficulties after the FPD intervention dropped from $\bar{X}=57.1$ ($SD=22.4$) to $\bar{X}=40.3$ ($SD=17.2$) only one week after the treatment, whereas one year later it was reduced to $\bar{X}=6.5$ ($SD=4.4$). Exceptions of the quick recovery were only two domains, mainly connected with the difficulties caused by dental pain. One year after the treatment, the scores of each of the domains of OHRQoL of the FPD patients were the same with those of the healthy individuals. The results indicated very satisfactory impact of this kind of dental appliance on oral health related to quality of life of FPD wearers.

Key words: oral health quality of life, fixed partial dentures, OHIP-MAC49

Introduction

In daily practice, dentists who are solving different prosthodontics cases, from their own professional perspective, mainly are satisfied with the given treatment. However, they indeed do not know much about the patients' perspective, their feelings, experiences and subjective assessment in the important aspects of their overall well-being, connected with wearing the particular prosthetic construction. It has been documented that patients' perceptions of their oral health status are important outcomes in prosthodontics¹. The contemporary views about oral health mean that dental practitioners should not only be engaged in providing absence of oral disease but also in taking care of patients' ability for fulfilling their everyday activities. According to Gerritsen et al., it is progressively more recognized that the impact of disease, its treatment and its consequences on quality of

life should be taken into account when assessing health status and evaluating treatment outcomes². Locker suggested that health problems may affect quality of life, so oral health disabilities should have an influence on peoples' quality of life^{3,4}.

The oral health-related quality of life (OHRQoL) is frequently defined as a composition of self-report, specifically pertaining to oral health that captures the functional, social and psychological impacts of oral disease⁵. In other words, this construct shows the perceived impact of oral diseases on important domains of people's every-day life. The very concept of OHRQoL has been validated cross-culturally and investigated in many studies⁶. A definition of quality of life which adopts the underlying belief that this concept has meaning only at personal

level, state that: »quality of life is concerned with the degree to which a person enjoys the important possibilities of life«⁷.

As it has been many times confirmed through the practice of almost any dentist, the assessment of oral health made by the dental practitioners is generally different to the opinion given by the patient. Also, there is a huge variability in the individual evaluations. For some patients, absence of teeth does not affect their social and psychological well-being but for the others, the same condition means a great attack on their everyday living in all possible social contexts. Moreover, even individual assessments vary over time and experience, such as coping, expectancy, adaptation and different circumstances⁸.

The increasing recognition of the importance of the subjective assessment of oral health resulted in proliferation of many oral health-related quality of life measurements. One of the most widely used and psychometrically tested instruments in many different cultures is OHIP-49. The OHIP questionnaire is frequently used to monitor changes of the OHRQoL due to its sensitivity to detect the impact of dental treatment and its extensive cross-cultural usage^{9–11}. This instrument has a short version (OHIP-14) that is much easier to use, with well-documented psychometric characteristics, but somewhat less responsive than the original instrument¹².

It is very important for dental practitioners to be able to estimate the influence of their therapy on patient's general health and quality of life, besides just solving the oral disease, since it is becoming more and more obvious that the best approach should be taking into consideration the combination of clinical and subjective indicators which will provide more comprehensive and multidimensional picture of a patient's oral health condition¹³. This is especially true if it is taken into account that the perception of the degree of impairment caused by different oral disease, especially toothloss, is influenced by many cultural, economic and social factors. Therefore, clinical evaluation is not sufficient for the correct solution of a situation, and it requires a psychosocial dimension to be added².

Measures of patients' perceived oral health are increasingly in demand for epidemiological and clinical studies because they add a complementary outcome dimension to the traditional use of clinical oral disease indicators¹⁴.

Taking into account that both oral healthcare researchers and oral health policy makers increasingly recognise that the assessment of oral health outcomes is necessary for planning sustainable oral healthcare programmes, the evaluation of the two aspects of oral health of the population – both the objective and the subjective one – are reflecting the modern approach in defining the overall oral health¹⁵. Data for OHRQoL have public health importance because they can as well be used to describe the impact of oral health on populations¹⁶.

In the recent years, it has been documented that by promoting and improving the implant technology, the

quality of life has been significantly improved after the treatment with implant-supported removable overdentures in comparison to the previous experience of wearing complete dentures^{17,18}. Tooth loss and its prosthodontics replacement have a potential impact on every aspect of people's quality of life. Most of the clinical studies are mainly focused on OHRQoL outcomes after the prosthodontics treatment with partial or complete removable dentures^{19–21}.

However, despite a considerable number of OHRQoL studies, only several of them assessed adult patients with fixed partial dentures (FPD) prosthodontic treatments. In order to contribute with empirical data in this area, we will use the Macedonian version of the OHIP-49 instrument (OHIP-MAC49)²². The better appropriateness of OHIP in comparison to generic instruments has been suggested in previous studies^{9,11,23}. Therefore, the aim of this study was to find out patients' self-perception about their oral health condition before treatment, one week and one year after the prosthodontics treatment with fixed partial dentures (FPD) as well as to compare the outcomes in relation with healthy patients, by identifying the changes in relevant aspects of quality of life.

Material and Methods

This one year longitudinal study of quality of life outcomes in patients with fixed partial dentures (FPD) was carried out at the University Dental Clinic Centre in Skopje. The study was approved by the Ethics Committee of the Faculty of Dental Medicine. The participation of all subjects was on a voluntary basis. Prior to agreeing to participate/prior to giving an informed consent, all participants were acquainted about the general aim of the study, type of the used questionnaire and the kind of information that they will be asked.

Subjects

A total of 70 participants (convenient sample) were included in the study. Half of them belonged to the group with necessity of fixed partial dentures (FPDG) and the other 35 were healthy patients without any need for prosthetic treatment, control group (CG). The majority of the FPD patients were edentulous in posterior region; seven of them had frontal bridges and only three of them circular bridges. The participants were selected using the criterion of previously diagnosed necessity of the prosthodontics therapy with fixed partial dentures in one jaw and the presence of natural teeth in the antagonistic jaw. They had not had any prior experience with prosthodontics appliances. The ceramic fused to metal fixed partial dentures were made in all patients by different dentists and technicians.

All selected subjects have had at least 12 years of formal education and their ethnic background is Macedonian. The FPD participants' age ranged from 29 to 56 years (\bar{X} age = 42.7 years; SD=7.2) whereas the average age of the control group of participants was lower (\bar{X} age = 38.7 years; SD=9.9). All FPD and control participants

were in good general health, without any prosthodontics appliance, with stable vertical dimension and without any TMJ problems. Seventeen (48.6%) participants in both groups were women.

Instrument

In order to assess the oral health and quality of life, we administered the OHIP – MAC49. It is a five point Lickert scale (0–4) consisting of 49 questions that compose 7 different subscales which indicate different aspects of oral self-perceived well-being: Functional limitation, Physical pain, Psychological discomfort, Physical disability, Psychological disability, Social disability and Handicap. In addition, the questionnaire results with a general (total) score indicated the degree of perceived oral health related well-being. The higher the scores, the lower is the self-evaluated oral health-related quality of life. The instrument was tested on Macedonian population and it has shown satisfactory psychometric qualities.

Procedure

According to the model for an adequate epidemiological design for using the OHIP-MAC49, we used the questionnaire by interviewing the participants. They all understood the questions very well and were fully able to cooperate. The group of participants with necessity of fixed partial dentures was interviewed three times: before the FPD treatment (baseline scores), one week and one year after the treatment. In other words, they answered the same set of questions in which they evaluated

how frequent an oral health problem occurred before, after the prosthodontics treatment and one year after it. The control group of patients was interviewed once, at the same time when the questionnaire was answered by the FDP group the third time. The whole procedure was under supervision of the authors.

Statistics

The OHIP scores and the OHIP subscale scores were calculated using the Statistical software SPSS 13 for Windows (Chicago, Illinois, USA). Descriptive statistics, Friedman’s test for related samples and one-way ANOVA (along with Sheffe post-hoc test) were used. A p-value less than 5% (p<0.05) was considered to be statistically significant.

Results

The mean OHIP scores (both for the whole scale and the 7 subscales) for the two groups of participants (FPDG and CG) are presented in Table 1. The significance in the difference between the three mean measurements in the FPDG (before treatment, 1 week and 1 year after the treatment) is also presented. There were significant differences between the follow-up scores one week after the treatment in comparison to the baseline scores in nearly all subscales and the OHIP summary score. Exceptions were two subscales: Physical disability (p=0.23) and Handicap (p=0.84). In other words, the scores of these two aspects of self-rated quality of OHRQoL had not changed in the period of one week after the treatment.

TABLE 1
MEAN OHIP SCORES (SD) IN FPD (BEFORE TREATMENT, 1 WEEK AND 1 YEAR AFTER PROSTHODONTIC TREATMENT) AND SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE THREE SCORES

| Variable | FPD | | | | | | CG | | | |
|--------------------------|------------------|------------------------|---------|------------------------|------------------------|-------|------------------|------------------------|-------|----------------|
| | Before treatment | 1 week after treatment | P | 1 week after treatment | 1 year after treatment | p | Before treatment | 1 year after treatment | p | Score |
| | \bar{X} (SD) | \bar{X} (SD) | | \bar{X} (SD) | \bar{X} (SD) | | \bar{X} (SD) | \bar{X} (SD) | | \bar{X} (SD) |
| OHIP Summary Score | 57.1 (22.4) | 40.3 (17.2) | <0.01 | 40.3 (17.2) | 6.5 (4.45) | <0.01 | 57.1 (22.4) | 6.5 (4.45) | <0.01 | 4.2 (2.9) |
| Functional limitation | 11.4 (4.3) | 8.6 (4.3) | <0.01 | 8.6 (4.3) | 2.55 (1.7) | <0.01 | 11.4 (4.3) | 2.55 (1.7) | <0.01 | 2.1 (1.7) |
| Physical Pain | 10.0 (5.0) | 6.2 (3.6) | <0.01 | 6.2 (3.6) | 1.5 (3.3) | <0.01 | 10.0 (5.0) | 1.5 (3.3) | <0.01 | 0.9 (0.9) |
| Psychological discomfort | 9.0 (4.6) | 5.9 (3.6) | <0.01 | 5.9 (3.6) | 1.6 (1.2) | <0.01 | 9.0 (4.6) | 1.6 (1.2) | <0.01 | 0.5 (0.8) |
| Physical disability | 9.7 (5.0) | 8.6 (4.1) | 0.23 NS | 8.6 (4.1) | 0.6 (0.9) | <0.01 | 9.7 (5.0) | 0.6 (0.9) | <0.01 | 0.4 (1.1) |
| Psychological disability | 7.7 (5.2) | 5.5 (4.0) | <0.01 | 5.5 (4.0) | 0.1 (0.2) | <0.01 | 7.7 (5.2) | 0.1 (0.2) | <0.01 | 1.0 (0.5) |
| Social disability | 4.8 (3.3) | 0.9 (0.8) | <0.01 | 0.9 (0.8) | 0.1 (0.2) | <0.01 | 4.8 (3.3) | 0.1 (0.2) | <0.01 | 0.0 (0.0) |
| Handicap | 4.5 (2.1) | 4.7 (3.1) | 0.84 NS | 4.7 (3.1) | 0.1 (0.3) | <0.01 | 4.5 (2.1) | 0.1 (0.3) | <0.01 | 0.2 (0.4) |

NS – not significant (p>0.05)

TABLE 2
SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE OHIP SCORES AT THE BASELINE AND FOLLOW-UPS OF THE
FPD PATIENTS AND THE CG

| Variable | FPD-CG | | |
|--------------------------|------------------|------------------------|------------------------|
| | Before treatment | 1 week after treatment | 1 year after treatment |
| OHIP summary | p<0.001 | p<0.001 | p=0.931 NS |
| Functional limitation | p<0.001 | p<0.001 | p=0.959 NS |
| Physical pain | p<0.001 | p<0.001 | p=0.929 NS |
| Psychological discomfort | p<0.001 | p<0.001 | p=0.475 NS |
| Physical disability | p<0.001 | p<0.001 | p=0.994 NS |
| Psychological disability | p<0.001 | p<0.001 | p=1.000 NS |
| Social disability | p<0.001 | p=0.200 NS | p=1.000 NS |
| Handicap | p<0.001 | p<0.001 | p=0.998 NS |

NS – not significant ($p>0.05$)

However, as it was expected, one year after the treatment, mean scores of all subscales along with the total scores were significantly lower in comparison to the baseline scores and the scores gained on the basis of the respondents' assessments one week after the treatment.

The comparison of the mean scores between the FPDG and CG presented in Table 2, shows significant differences in baseline measurement and that one week after treatment. One week after the treatment, the assessment of the OHRQoL of FPDG became equal with that made by the CG only in respect with the social disability ($p=0.20$). The comparison between the mean scores (total OHIP score and the seven OHIP subscales) of the control group and the FPD group one year after the treatment revealed that there were no significant differences along all subscales, including the total OHIP score (Table 2).

Discussion and Conclusion

The impact of the oral disease on psychological and social well-being of the patients is very important aspect of modern living, because oral disorders frequently compromise aspects of daily living that are of significant importance for the majority of individuals. In order to identify patients' changes in relevant aspects of quality of life, the OHIP-MAC49 questionnaire was administered at different observation periods in patient groups: before treatment, one week after and one year after the treatment. The reason to observe the patients for a longer period was due to the fact that longitudinal measurements evaluate better the overall success of dental treatment in comparison to the short observation period^{11,24}.

The results of this study clearly shows that the self-rated quality of life in relation to oral health of FPD patients improved after fixed prosthodontic treatment, compared to the situation before treatment. The improvement was felt very soon after the treatment in almost every well-being aspect defined by the OHIP model and one year after it, in every included dimension. In

other words, the OHIP summary and subscale scores of the FPD patients before and after the prosthodontics treatment demonstrated declining of the OHIP scores even more in the one year follow-up, meaning that the OHRQoL after therapy with fixed partial dentures was considerably improved.

These findings are in consistence with the other research data. For instance, the longitudinal analyses before and after prosthodontic treatment with fixed and removable dentures show that the fewest problems were observed during the first month by patients receiving FPD but problems disappeared very fast and most completely in FPD wearers²⁵. In our case, the recovery was even faster. On the other hand, it opposes findings, suggesting that FDP treatment improved the OHQoL, but not by individuals without need for dental treatment²⁶, because a year after the treatment, no significant differences between the FPDG and the CG were found.

A decrease of the OHIP summary score and scores in all subscales was registered as early as one week after FPD were temporarily cemented. There were two exceptions – one regarding the Handicap subscale, and the other regarding Physical disability subscale. The subscale Handicap is composed of indicators about how the general health and well-being were affected by the dental disease and whether it influenced the working capacities and every day activities of the patients. Most probably, the slower recovery in this domain stems from the fact that the procedure is associated with pain, anxiety and for some patients, considerable expenditures that all together still influence the evaluation. Similarly, in the domain of physical disability, the decrease of OHIP scores one week after the intervention was not statistically significant. That is probably because the participants did not have any experience with prosthetic appliance before and some abutment teeth might had still been sensitive, causing difficulties in chewing or pronouncing particular sounds.

The findings of this study showed very quick benefits of the intervention. Similar findings were presented by

Petricevic et al. in their 3-year-longitudinal study. However, the results in the study conducted by Petricevic et al. suggested that improvement of the quality of life of FPD patients the period as short as three weeks was not sufficient to show recovery in all domains of oral health related to well-being¹¹. It is very likely that these differences stem from the differences in the average age of the subjects – the FPD group that recovered slowly, has considerably higher age average (\bar{X} age = 57.6 years, SD = 14.4) than the one tested in this study (\bar{X} age = 42.7 years; SD=7.2).

Furthermore, our results have shown that one year after the treatment with FPD a decrease in the OHIP summary score was registered as well as in the scores of all subscales, compared with baseline scores. Statistically significant differences between the three scores ($p < 0.01$) were registered as well. In the FPD group before treatment, missing teeth caused problems that reflected as high average scores at each of OHIP subscales and summary score (Table 1). After the conventional FPD therapy, the OHRQoL in FPD patients increased in all aspect of quality of life and was nearly the same with that in CG patients, revealing high patient's satisfaction and oral health improvement.

Yet, although improvements in many domains of the OHRQoL were registered very soon after the intervention, FPD patients' scores one week after the intervention were considerably higher than those of the healthy individuals from the CG, with the exception of Social disability subscale. This means that the fixed partial dentures helped only in overcoming the feelings of shame and inferiority caused by the toothlessness, but the recovery in other areas was slower. However, it is important to emphasize that there was no significant difference between the OHIP scores in CG group and FPD group in the period of one year after treatment which means that patient's self-perception about the OHRQoL in FPD patients after the period of adaptation is virtually the same with the perception of healthy individuals, with good oral health conditions.

These findings are in accordance with those of Petricevic et al. and Ozhayat and confirmed high satisfaction

and OHRQoL improvement in FPD patients^{11,26}. Although recent findings suggest superiority of using implant-supported fixed dentures and implant-supported overdentures over conventional prosthodontic appliance²⁷, within the limitation of available literature review, it can be concluded that the FPD patients also benefit very much from the intervention in a long run. In a situation where there is insufficient available scientific evidence about the expected benefit of different treatment alternatives, it is difficult for the clinician to provide the patient with information in a way that offers a reliable basis for making a decision. Study results must be presented primarily to individual patient and take into account the influence of individual variations on treatment outcome²⁸.

In conclusion, the results indicate a huge impact of oral conditions associated with FPD wearers on oral health related-quality of life. Prosthodontic treatment with FPD showed significant improvement of the patient's OHRQoL during the first week, and further improvement in one-year period.

This study has several limitations. First, mainly due to difficulties in recruiting subjects who would like to participate in a longitudinal research, it was conducted with a small number of participants that were not randomly selected. These specifics pose serious challenge for the possibility of generalizing the results. In addition, the control group of participants was not matched in respect to several relevant variables, primarily the age and the social status, which might affect the variability of the two groups. In order to get more relevant results the number of participants in both groups should be larger and the participants in CG group should be healthy individuals without any prosthodontic appliance, matched according to the mentioned characteristics. Finally, it is difficult to ascribe the improvement of the OHRQoL over time only to the intervention itself. The instrument by which the data were collected has no safeguards against reactivity of respondents. Since the questionnaire was administered in the presence of a dentist, there is a possibility that the respondents, unconsciously or not, might have answered in a desirable manner.

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ORALNO ZDRAVLJE I KVALITETA ŽIVOTA (OHRQOL) U PACIJANATA S FIKSNOM PROTEZOM

SAŽETAK

Cilj ovog longitudinalnog istraživanja bio je saznati vlastitu percepciju pacijenata o svom oralnom zdravstvenom stanje prije tretmana, tjedan dana nakon i jednu godinu nakon tretmana fiksnom protezom (FPD), kao i usporediti rezultate sa zdravim pacijentima, identificirajući promjene u relevantnim aspektima kvalitete života. Ukupno 70 ispitanika – 35 s nužnosti nošenja fiksne proteza (FPD) i 35 zdravih pojedinaca bez ikakve potrebe za protetsku terapiju, kao kontrolnu skupinu (CG), sudjelovali su dobrovoljno odgovarajući na OHIP – upitnik MAC49 za utvrđivanje samoprocjene kvalitete života na temelju oralnog zdravlja (OHRQoL). FPD grupa odgovarala je u tri vremenska intervala – prije FPD intervencije, tjedan dana nakon i godinu dana nakon tretmana. Kako bi se ispitalo u kojoj mjeri je došlo do poboljšanja u samoprocjeni kvalitete života, uspoređene su te tri mjere provedene tijekom različitih vremenskih razdoblja. Ovaj skup od tri procjene iz FPD skupine također se usporedio s prosječnim ocjenama od CG. Rezultati su pokazali vrlo brzo poboljšanje u gotovo svim domenama OHRQoL definiranih mjerila, nakon tretmana FPD. Ukupna srednja vrijednost doživljenih ili uočenih problema nakon FPD tretmana pala je s $X=57,1$ ($SD=22,4$) na $X=40,3$ ($SD=17,2$), samo tjedan dana nakon tretmana, dok je godinu dana kasnije smanjena na $X=6,5$ ($SD=4,4$). Iznimke od brzog oporavka bile su samo u dva područja, uglavnom u vezi s poteškoćama uzrokovanim dentalnom boli. Godinu dana nakon liječenja, rezultati svake od domena OHRQoL kod FPD pacijenata bili su izjednačeni s onima u zdravim pojedincima. Rezultati su pokazali vrlo zadovoljavajući učinak ove vrste zubnog aparata na oralno zdravlje i na kvalitetu života FPD pacijenata.