

SELF-PERCEIVED ESTHETICS, CHEWING FUNCTION AND ORAL HEALTH-RELATED QUALITY OF LIFE IN PATIENTS TREATED WITH NEW REMOVABLE DENTURES

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ABSTRACT

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Introduction: The aim was to assess treatment outcomes using the standardized questionnaires for assessment of self-perceived orofacial esthetics (OE), oral health-related quality of life (OHRQoL) and chewing function (CF) in patients treated either with new complete dentures (CD group) or with maxillary complete dentures and mandibular Kennedy Class I long saddle removable partial dentures (CD-RPD group). The aim was also to compare the two groups and to assess possible gender and age effects.

Methodology: One hundred twenty-six patients (72 female and 54 male) participated (mean age 67.8±9). They were divided into two groups: the CD group (68 patients) and the CD-RPD group (58 patients). The patients filled in the three standardized questionnaires (Oral Health Impact Profile-OHIP14; Orofacial Esthetic Scale-OES and Chewing function questionnaire-CFQ), twice, first at the baseline, and the second time at least 2 months after they had received their new removable dentures and all adjustments had been finished.

Results: All patients with new removable dentures (CD and CD-RPD group) reported improved aesthetics, chewing function and OHRQoL. Gender and age by itself yielded no significant effects. The type of RPD treatment (CD: CD-RPD) yielded statistically significant differences only with respect to orofacial aesthetics, while there was no significant differences with respect to CF and OHRQoL.

Conclusion: Better aesthetic outcomes in the CD group than in the CD-RPD group could be attributed to clasp visibility in the mandible. Clasps in the CD-RPD group did not significantly improve CF when compared with the CD group.

Keywords: patient-based outcomes, removable dentures, orofacial esthetics, chewing function, OHRQoL.

1. Introduction

Despite improvements of oral health care, the need for conventional complete and removable partial dentures has still been in high demand, especially in the elderly population and in lower income socio-economic groups.¹ Moreover, despite the growing trend to use implant supported removable dentures, conventional complete and removable partial dentures have still been the most common treatment option.^{2,3} Many edentulous patients refuse implant placement due to their

financial limitations, general health problems, insufficient bone support, fear, or attitude.⁴⁻⁷ The impact of oral disorders and interventions on individually perceived oral health outcomes has been increasingly recognized as an important oral health component. The most popular instrument for oral health assessment has been the Oral Health Impact Profile (OHIP) questionnaire (the long and the short form). The OHIP measures several dimensions of oral health related quality of life (OHRQoL).⁸⁻¹⁵ Some other one-dimensional questionnaires have also been popular, such as

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Orofacial aesthetics scale (OES)	Oral Health Impact Profile (OHIP-14)	Chewing Function Questionnaire (CFQ)
How do you assess appearance of during the last 7 days	Have you had (problems or feelings that) because of problems with teeth, mouth, dentures? during the last 7 days	Have you had any difficulty chewing foods such as (or similar)? during the last 7 days
1. The lower third of your face	1. Pronouncing words	1. Apple, pear, raw carrots
2. Your profile appearance of the lower third of your face	2. Sense of taste worsened	2. Bacon, firm meat
3. Your mouth (smile, lips, visible teeth)	3. Painful aching (mouth, teeth)	3. Biscuits, crackers
4. Your dental arches	4. Uncomfortable to eat any foods	4. Fresh bread, doughnut
5. Assess shape of your teeth	5. Been self-conscious	5. Nuts, pecan, almonds, peanuts, macadamia
6. Assess the color of your teeth	6. Felt tense	6. Lettuce, raw cabbage
7. Your gums or artificial gums	7. Diet been unsatisfactory	7. Biting different foods, incision
8. Assess the overall appearance of your lower third of the face, mouth and teeth	8. Interrupt meals	8. Chewing gum
	9. Difficult to relax	9. Have you felt insecure when chewing
	10. Feel a bit embarrassed	10. Have you noticed food catching on your teeth or tooth replacement
	11. Irritable with people	
	12. Difficulty doing usual jobs	
	13. Life in general less satisfying	
	14. Totally unable to function	
Scores 1-5; Summary score 8-40	Scores 0-4; Summary score 0-56	Scores 0-4; Summary score 0-40

Figure 1. A brief overview of questionnaires used in the study with their summary score ranges and questions (items)

the Orofacial Esthetic Scale (OES)¹⁶⁻¹⁸ for patient's self-evaluation of orofacial aesthetics and the Chewing Function Questionnaire (CFQ)¹⁹ for patient's self-evaluation of a chewing function (CF). The objective of this study was to assess treatment effects and after-treatment scores considering self-perceived OHQoL, chewing function (CF) and orofacial aesthetics (OES) in patients treated with new complete dentures (CD group), and in patients treated with maxillary complete dentures and mandibular Kennedy Class I long saddle removable partial dentures (CD-RPD group). The aim was also to compare the two groups and to assess possible gender and age effects.

2. Methodology

The study was approved by the Institutional Ethics Committee. One hundred twenty-six (126) patients (72 female and 54 male) participated. The patients were divided into two groups: the CD group (rehabilitated with new complete dentures in both jaws) and the CD-RPD group (treated with new complete dentures in the maxilla and long saddle clasp-retained removable partial dentures in the mandible (Kennedy Class I, edentulous posterior areas bilaterally). There were 68 patients

in the CD group (40 females, 28 males), mean age 69.58 years (± 11.17) and 58 patients in the CD-RPD group (32 females, 26 males) mean age 66 years (± 8.0). In the CD-RPD group there were no teeth present distally from cuspids and/or second incisors in the mandible. All dentures were made by postgraduate students during training courses for the Prosthodontics Specialist degree. Mandibular partial dentures were made of metal and acrylic resin in order not to break, while all complete dentures were made only of acrylic resin (Polymethyl methacrylate; PMMA).

All CD patients had old pairs of complete dentures. In the CD-RPD group all patients had their old complete denture in the maxilla and 74.1% of them had already old partial removable denture (RPD) in the mandible, while 25.9% patients were the first time removable partial denture wearers in the lower jaw.

The Croatian version of the OES-CRO was used to assess patients' self-perceived orofacial esthetics. The patients rated their orofacial aesthetics on a Likert scale ranging from 1 to 5 (1=completely dissatisfied; 5=completely satisfied; the summary score ranged from 8 to 40, the higher summary scores indicated greater satisfaction with orofacial

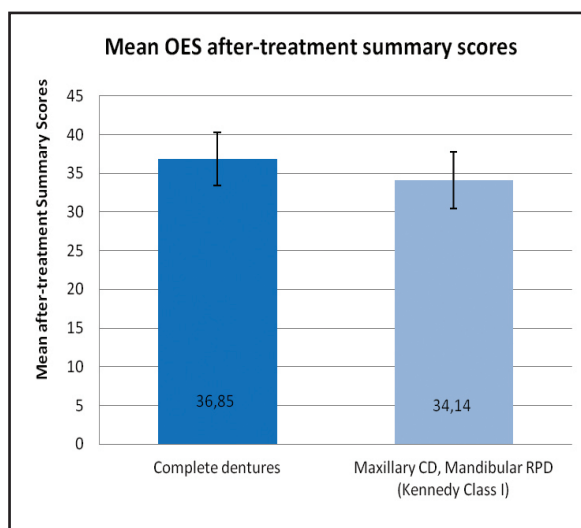


Figure 2a. Mean values and standard deviations of the after-treatment OES summary scores in the CD and the CD-RPD group of patients

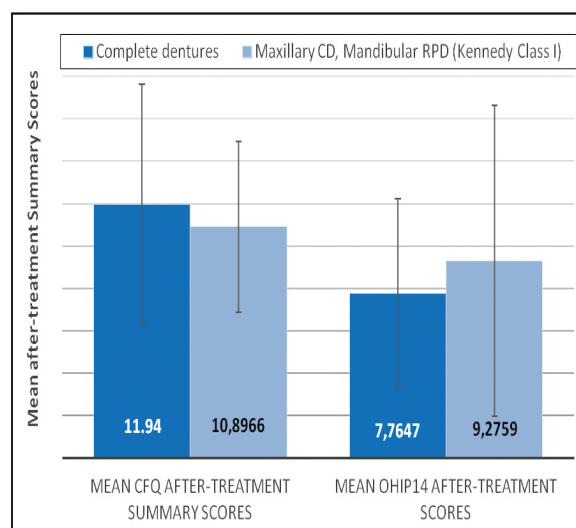


Figure 2b. Mean values and standard deviation after treatment CFQ and the after-treatment OHIP summary scores in the CD and the CD-RPD groups of patients

aesthetics) (Fig.1). The OHRQoL was measured using the Croatian version of the OHIP-14 questionnaire.⁶ The patients filled in the OHIP-14 questionnaire using a Likert type scale ranging from 0=no difficulties to 4=maximum difficulties. The summary scores ranged from 0 (minimum) to 56 (maximum), the higher score represented more impaired OHRQoL (Fig. 1). The Chewing Function Questionnaire (CFQ) was used to measure patients' self-perceived chewing function. The CFQ consisted of 10 items (ratings were made on the Likert scale from 0=no difficulties to 4=maximum difficulties; summary scores ranged from 0 to 40; higher scores represented more impaired chewing function) (Fig. 1).

The patient had to assess their difficulties, or rate their aesthetics for a period covering the last 7 days, as recently recommended.¹⁵ All three questionnaires have been psychometrically tested in previous studies and have demonstrated excellent psychometric properties.^{10, 17, 19} The patients filled in the questionnaires twice, first at the baseline, when they came to a dental clinic seeking therapy and the second time at least 2 months after they had received their new removable dentures and all adjustments had been finished.

Statistical analysis (SPSS 20 for Windows, IBM) included descriptive statistics, paired t-test (to test the significance of the differences between the baseline and the after-treatment scores), independent t test to compare the two groups (the CD and the CD-RPD group), and the 2 factor ANCOVA with the after-treatment OES, the after-treatment OHIP 14, or the after-treatment CFQ scores as dependent variables: treatment groups (the CD and the CD-RPD group) and gender as fixed factors, and age as a covariate. P values of 0.05 or less were considered statistically significant.

3. Results

Mean after-treatment summary scores of the OES, the OHIP14 and the CF questionnaire in the CD and the CD-RPD groups are presented in Figure 2 a and b. All patients significantly improved aesthetics, chewing function and OHRQoL compared to the baseline scores ($p < 0.01$). Significantly higher OES after treatment summary scores, were registered in the CD group than in the CD-RPD group ($t = 4.3$, $df = 124$, $p < 0.01$) (Fig. 2a). Slightly lower CFQ after-treatment summary scores (better chewing function) were registered in the CD-RPD group than in the CD group, but the difference was not statistically significant ($t = 1.14$, $df = 124$, $p > 0.05$) (Fig. 2b). However, slightly lower OHIP14 after-treatment scores were registered in the CD group than in the CD-RPD group. The difference was also not statistically significant ($t = 1.46$, $df = 124$, $p > 0.05$) (Fig. 2b).

Mean differences (deltas) between the baseline and the after-treatment summary scores (score reduction) for the OES, the OHIP14 and the CFQ questionnaires are presented in Figure 3. The CD-RPD patients benefited more from the treatment than the CD patient, although the difference was not statistically significant ($p > 0.05$).

The two factor ANCOVA with the mean after-treatment OHIP14 summary score as the dependent variable, the type of treatment (CDs or CD-RPDs) and gender as fixed factors and age as a covariate, revealed no significant effect of the type of treatment ($F = 0.89$; $p = 0.35$), gender ($F = 2.61$; $p = 0.11$) and age ($F = 3.25$; $p = 0.08$) (Table 1). The same analysis was done for the dependent variable: the after-treatment CFQ summary score also revealed no significant effect of the type of treatment ($F = 1.37$; $p = 0.24$), gender ($F = 1.65$; $p = 0.20$), and age ($F = 0.26$; $p = 0.61$).

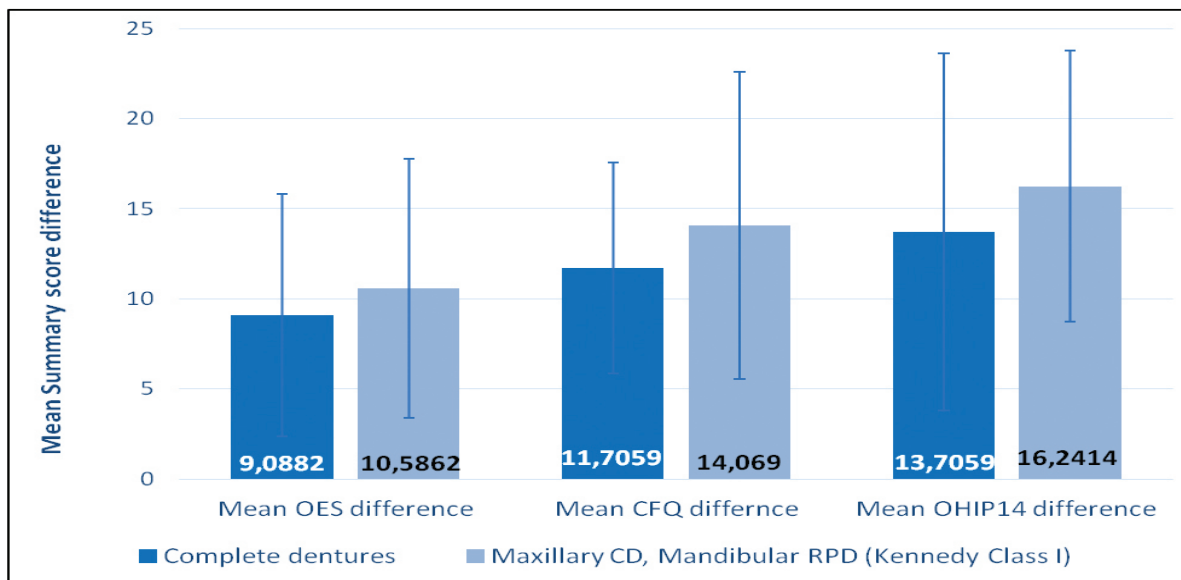


Figure 3. Mean differences between the baseline and the after-treatment scores of the OES, OHIP14 and CF questionnaires in the CD and the CD-RPD group of patients

However, with the mean after-treatment OES summary score as the dependent variable, the effect of the factor type of treatment was statistically significant ($F=5.60$, $p<0.01$), while gender ($F=0.02$; $p=0.9$) and age ($F=0.8$; $p=0.37$) showed no significant effects. Patients with CDs in both jaws rated their aesthetics significantly better (higher scores) than the CD-RPD group.

4. Discussion

The treatment of complete or partially edentulous patients has long been a major challenge in prosthodontics. Many studies had confirmed significant benefit of an implant-prosthodontic therapy.²⁰⁻²² Removable dentures receiving support from dental implants have been improving patients' OHRQoL and/or chewing function better than the conventional removable denture therapy.²⁰⁻²² However, the conventional complete and removable partial dentures have still been the most common treatment in the world, mostly due to medical and/or economic factors.²³⁻²⁵ Therefore we decided to analyze treatment results obtained by conventional removable dentures. The success of conventional treatment with removable dentures often depends mostly on the patients' adaptive capacity to overcome reduced retention and stability of dentures.²⁶

Patient-based outcome measures using psychometrically verified questionnaires have been recognized as important measures necessary to understand problems regarding orofacial issues. The results of such specific measures help dentists in planning and decision making.²⁷⁻²⁹

We measured OES, CF and OHRQoL by standardized questionnaires to get better insight into the most common types of conventional removable denture therapy. The most frequent type of removable denture patients have been either completely edentulous patients in both jaws, or those who have been completely edentulous in

the maxilla and Kennedy Class I (with only incisors and incisors and canines left) in the mandible. Therefore we have chosen such groups of patients. As expected, both treatment options elicited significant treatment results and all after-treatment summary scores showed improvement of the issue measured (OHRQoL, CF, OES), compared to the baseline scores. The CD-RPD treatment showed slightly higher treatment effects than the CD treatment (although not significantly), which may be attributed to the fact that all CD patients had a previous pair of dentures, while some of the CD-RPD patients had no previous dentures in the mandible and therefore had worse baseline scores.

Significantly lower after-treatment ratings of orofacial esthetics in the CD-RPD group than in the CD group may be attributed to the visibility of denture clasps in the mandible. Slightly better after treatment chewing function assessment in the CD-RPD group than in the CD group was attributed to the better retention of RPDs due to denture clasps as compared to complete mandibular dentures.

However, slightly lower OHIP14 after-treatment scores registered in the CD group (better OHRQoL) may be attributed to clasp visibility. Some studies reported that besides the type of treatment, gender and age may also influence clinical outcomes by new removable dentures.^{23,30} To test the premise, the 2 way analysis of variance (ANCOVA) was performed with the OHIP14, the OES and the CFQ after treatment summary scores as dependent variables; gender and the type of treatment as independent variables, and the age as a covariate.

The results revealed that gender and age yielded no significant effects ($p>0.05$), either for a chewing function, or for the OHRQoL or orofacial aesthetics. However, limitations of the study have to be mentioned, such as various pre-treatment summary scores, as well as variability in a number

and difference of periodontal status of remaining teeth in the mandible in the CD-RPD group.

5. Conclusion

All patients with new removable dentures (CD and CD-RPD group) reported improved aesthetics, chewing function and OHQoL compared to the baseline scores. Gender and age by itself yielded no significant effects. The type of RPD treatment (CD: CD-RPD) yielded statistically significant effect only considering orofacial aesthetics with better

aesthetic outcomes in the CD group, which may be attributed to the clasp visibility in the CD-RPD group. Clasps had not significantly improved chewing function in the CD-RPD group compared with the CD group.

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Questions

Which instrument was used to assess patients' self-perceived orofacial aesthetics:

- ☐ a. Oral Health Impact Profile questionnaire;
- ☐ b. Orofacial Esthetic Scale;
- ☐ c. Questionnaire of Participants' Satisfaction with their Dental Appearance;
- ☐ d. Geriatric Oral Health Assessment Index.

Which of the following statements about OHIP14 Questionnaire is false?

- ☐ a. It is an instrument which measures self-reported several dimensions of oral health-related quality of life;
- ☐ b. It consists of 14-items;
- ☐ c. The summary scores range from 0 (minimum) to 40 (maximum);
- ☐ d. Higher scores represent more impaired OHRQoL.

The chewing function questionnaire has been developed to measure:

- ☐ a. How patients are satisfied with the new dentures;
- ☐ b. How patients rate their oral health-related quality of life;
- ☐ c. How patients rate difficulties while chewing different foods (including food incision) and the summary score shows the result;
- ☐ d. Difficulties only during food incision

When using a structured questionnaire in a new cultural environment one needs to:

- ☐ a. Translate a questionnaire;
- ☐ b. Translate a questionnaire and check the back-translation;
- ☐ c. Translate a questionnaire and check the back-translation, as well as internal reliability (Cronbach alfa);
- ☐ d. Translate a questionnaire, check the back-translation and other psychometric properties, such as reliability (internal reliability and test-retest), validity (convergent, divergent, etc.) and responsiveness (when possible).