

ASSESSMENT OF THE IMPACT ON QUALITY OF LIFE IN ADULT PATIENTS TREATED WITH NEW COMPLETE REMOVABLE DENTURES

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ABSTRACT

This work was done under the current appreciation that both medicine and dentistry currently have of improving the quality of life (QL) of patients with finished treatments. The aim of this study was to research whether there was an improvement in the Oral Health-related Quality of Life (OHRQL) on bimaxillary toothless adult patients rehabilitated with new complete dentures in a Clinic of Removable Prosthodontics in the School of Dentistry, Universidad de la República, Uruguay. One hundred bimaxillary edentulous adult patients were included. They did not have an intellectual disability nor a systemic disease affecting their oral functions. To measure the OHRQL, the Oral Health Impact Profile-14 (OHIP-14) was used. The scores studied were: before the rehabilitation (pretreatment) 9.42 ± 7.79 , at the moment of the patient's discharge (immediate follow-up) 3.13 ± 4.49 and three months after the discharge (intermediate follow-up) 2.13 ± 3.32 . We observed a reduction between the first and the second measurements ($p < 0.001$), which was greater when comparing the first with the third measurement ($p < 0.001$).

The results obtained indicate that there was a significant statistical improvement of the OHRQL as perceived by the surveyed patients.

Keywords: quality of life, complete dentures, OHIP-14, elderly.

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INTRODUCTION

Health-related quality of life

The earliest reports on the concept of QL date back to the 1950s, according to Botero and Pico¹. However, it was only in the 1980s that it was widely incorporated into health status assessments.

One of the definitions of QL most commonly found in the literature is that of Felce and Perry², who state that it is “a combination of life conditions and satisfaction with these life conditions weighted by scales of personal values, aspirations, or expectations”. This definition shows that the concept of QL is not strictly objective, it also has subjective elements. There are sociological approaches that give great importance to quality of life assessments, especially in the elderly³. QL has been classified into the following three levels: a high level, involving complete satisfaction of the individual with life and the feeling of well-being; a medium level with a broad domain of satisfaction comprising the four categories: physical condition and functional abilities, psychological state and well-being, social interactions and economic condition; and a low level of dissatisfaction, indicated by specific aspects of several diseases⁴. Health is one of the factors to be assessed in the broad concept of quality of life. Health in relation to QL is a multidimensional concept representing a combination of overall health and the perception one has of their health or current or potential disability. In general, disease and disability are complemented with domains that reflect social, psychological and physical functions, as well as health perceptions and opportunity⁵.

Both medicine and dentistry are currently not exclusively based on evaluating health status, or diagnosing and treating disease, but also on considering the perception the patient has of the extent to which their quality of life is compromised by these organic problems. There is no doubt that oral diseases can influence the QL of individuals because they affect their masticatory or phonetic function, physical appearance and social life^{5,6}. Furthermore, the increase in the life expectancy of the population entails an increase in the needs, especially in this age group, to assess the QL gained with dental treatments⁶. Consequently, the concept of quality of life has been incorporated and become increasingly relevant for oral health. OHRQL has been defined as a multi-dimensional and self-reported assessment that measures the impact of oral conditions on daily activities. It is more and more used to assess oral health, as a guideline for prioritizing resource investment, as an indicator for measuring the efficacy in oral health interventions and the results of dental care in groups of elderly people⁷.

OHRQL measurement instruments

Two of the indicators or instruments used most frequently to measure the OHRQL are the “Geriatric Oral Health Assessment Index” (GOHAI), currently renamed “General Oral Health Assessment Index”⁸ and the “Oral Health Impact Profile” (OHIP). In 1994, Slade and Spencer⁹ described the so-called “Oral Health Impact Profile - 49” (OHIP-49) based on 49 questions about 7 dimensions connected to oral health: functional limitation, physical pain, psychological discomfort, physical disability, social disability and handicap. Each question is scored on the Likert scale and weighed with a decimal to obtain the final value. Thus, the lower the score, the better the quality of life is considered to be. Participants must complete a self-administered questionnaire using the above-mentioned scale: never (value 0), hardly ever (value 1), occasionally (value 2), fairly often (value 3), very often (value 4).

Due to the fact that the 49-item instrument was too long and made epidemiological studies difficult, in 1997, Slade¹⁰ published a summarized version of the index, the “Oral Health Impact Profile - 14” (OHIP-14), which has 14 questions, 2 from every dimension of the original index, and is intended for measuring the functional limitation, as well as the psychological and social disability in relation to the oral condition. Even though some authors^{11,12} claim that using it entails some risks that can affect its accuracy, as a psychometric instrument, OHIP-14 has shown a high degree of coincidence with the 49-question original. It is now regarded as the instrument of choice for measuring OHRQL in elderly patients because it is reliable, sensitive to change, has cross-cultural consistency and has been validated in several languages and used in multiple studies^{10,13-18}. Moreover, the OHIP-14 is more efficiently applied because it achieves a 100% answer rate, avoiding bias tiredness and memory biases of the respondent, which is even more important for the elderly population¹⁹.

However, a limitation of the OHIP-14 is that some items of interest for the assessment of prosthodontic treatments were excluded, which can affect the measurement properties in evaluating the results. In studies of edentulous patients^{20,21} there was a high prevalence of “0” scores (i.e., no impact) for most of the 14 items. This phenomenon, called “floor effects”, makes measuring the impact of the change of interventions difficult. In view of this, Allen and Locker proposed, in 2002²¹, a shortened version of the OHIP for edentulous adults called OHIP-EDENT.

Quality of life in edentulous patients

The OHRQL has proven to be inferior in edentulous patients than in dentate patients. Completely edentulous patients who do not wear dentures are those with the worst OHRQL^{9,22,23}.

For a long time, completely edentulous patients have been rehabilitated with complete removable dentures to improve their QL, but there has been no scientific confirmation of this mission. There are currently authors who claim that the use of QL indicators, combined with objective clinical tests, can help with the decision to make new dentures^{22,24}. The QL of edentulous patients is improved with properly working dentures, since they contribute to functional comfort, a better appearance and they also improve the patient's social life. Although unstable or uncomfortable dentures can have a negative impact on QL²², there are contradictions regarding the influence of replacing old dentures. On the one hand, there are those who report that it improves function and psychological comfort^{24,25}, but others did not notice significant improvement^{26,27}. A moderate positive correlation between the satisfaction of patients and the quality of the dentures used has also been found, as improvements in chewing, speaking and confidence when the qualities of dentures were improved^{28,29}.

Aim of this study

The aim of this study was to research the influence of rehabilitation with complete removable dentures (CRD) on the quality of life of patients treated in the School of Dentistry, Universidad de la República. The goal was to present evidence that the Quality of Life of bimaxillary toothless adult patients improves after having new complete dentures made, using the OHIP-14.

MATERIALS AND METHOD

Sample

We conducted a longitudinal study aimed at bimaxillary edentulous adult patients who sought care at the Rehabilitation, Removable Prosthodontics I and Gerodontology Clinic of the School of Dentistry, Universidad de la República.

All patients treated by undergraduate studies during the clinical course of rehabilitation of complete edentulous patients in 2012 were included. The patients who were included met the following requirements: completely bimaxillary edentulous patients who already wore dentures and sought rehabilitation with new bimaxillary CRD, with no intellectual

disability that could prevent them from understanding the questionnaires and without any systemic disease affecting their oral functions (these aspects were determined based on the medical records regularly used in the course). One hundred patients were invited to participate, 91% of whom agreed and, of those, 74% completed the study (**Figure 1**).

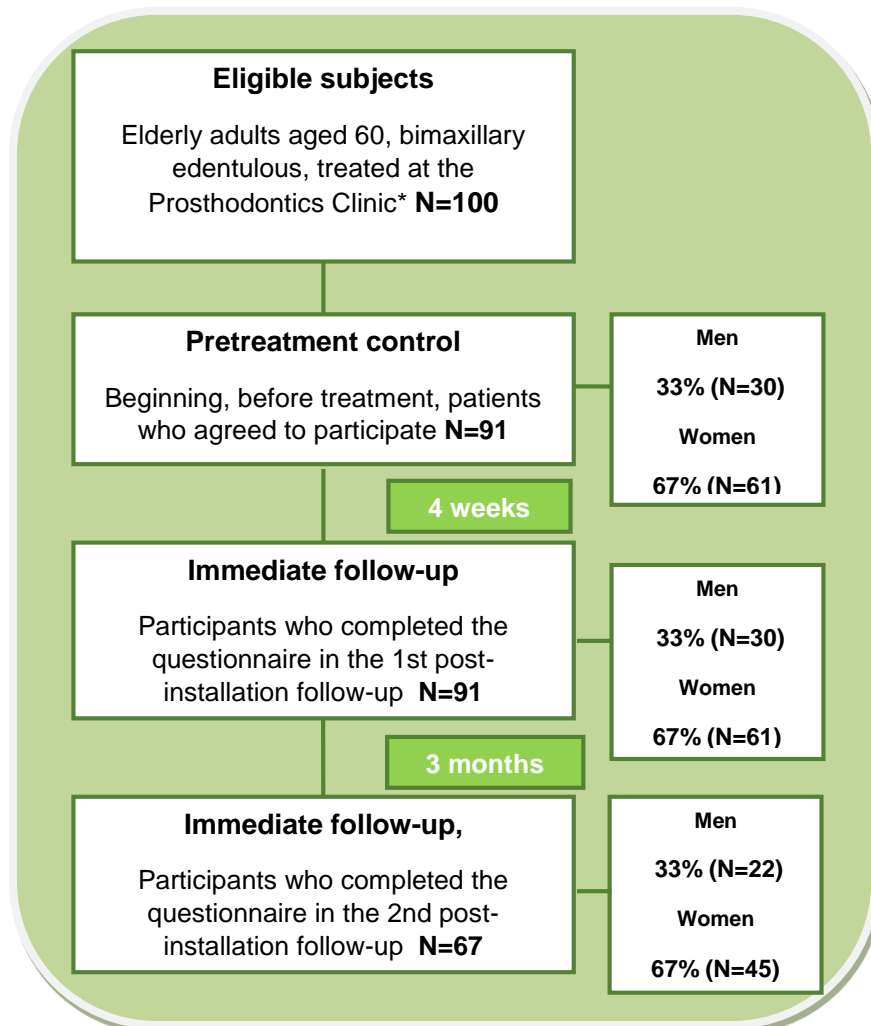


Figure 1. Flow diagram of the study.

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Ethical considerations

The research project was submitted to and approved by the Research Ethics Committee of the School of Dentistry, Universidad de la República (Approved on 3 August 2011). Each patient was given verbal and written advice on the study that would be conducted. After agreeing to participate in the study, patients were asked to sign a written informed

consent. To ensure participant confidentiality, the database created did not disclose their identities.

Questionnaire and procedures

The details about sex, age and OHRQL were collected using a questionnaire. The OHRQL was assessed using the “Oral Health Impact Profile -14” (OHIP -14)¹⁰. Participants answered a self-administered questionnaire using the 0-4 scale of the index mentioned above^{9,10}. As suggested by Slade^{6,10,30}, said score was multiplied by the corresponding weight for each question as follows: question 1: 0.51, question 2: 0.49, question 3: 0.34, question 4: 0.66, question 5: 0.45, question 6: 0.55, question 7: 0.52, question 8: 0.48, question 9: 0.60, question 10: 0.40, question 11: 0.62, question 12: 0.38, question 13: 0.59, and question 14: 0.41. Thus, the lower the patient’s score, the better their assessment of their quality of life.

The OHIP-14 used in this study was validated and adapted to Spanish¹⁵ (**Figure 2**). Two trained operators delivered and explained the questionnaire to participants and remained by their side to answer any possible doubts. The OHIP -14 was applied three different times: 1) during the visit at the Clinic, but before receiving the new dentures, in order to assess the quality of life before the treatment was finished (pretreatment); 2) four weeks after the installation of the new dentures at the time of the patient’s discharge (immediate follow-up); and 3) during a follow-up visit three months after the installation of the new dentures (intermediate follow-up).

Think of the last year (last 12 months) and mark with a cross the box corresponding to the frequency with which your mouth, teeth or dentures have caused you any trouble or difficulty during the following activities:

	Never	Hardly ever	Occasionally	Fairly often	Very often
Trouble pronouncing words correctly					
Feeling of bad taste					
Painful sensation (discomfort, pain...)					
Uncomfortable when eating					
Awareness or concern for problems with your mouth					

Tension, anxiety due to problems with your mouth					
Unsatisfactory daily eating (diet) due to problems with your mouth					
Interrupting meals due to problems with your mouth					
Nervousness or difficulty relaxing, due to problems with your mouth					
Unsatisfied, embarrassed because of how your mouth looks					
Sensitive, irritable due to problems with your mouth					
Difficulty doing your usual work, due to problems with your mouth					
Feeling of having a less satisfactory life, due to problems with your mouth					
Feeling of being unable to lead a normal life, due to problems with your mouth					

Figure 2. The OHIP-14 used

Statistical analysis

A descriptive analysis of the following variables was carried out: sex, age groups and OHRQL through the OHIP-14 globally in three months of assessment. Pretreatment, immediate and intermediate follow-up OHRQL values were compared. Since the OHRQL measurements did not follow a normal distribution, nonparametric statistical tests were used for the comparative analysis (Wilcoxon test for paired data) and the statistical significance was set at 5%. The PSPP Public Social Private Partnership software (<http://www.gnu.org/software/pspp/faq.html>) was used.

The effect size for the OHIP-14 scores was also calculated to measure responsiveness or sensitivity to change. The effect size is a measurement based on the distribution of the value of the change detected. It is calculated by dividing the mean of the difference between the pre and post-treatment scores by the standard deviation of the pretreatment score. The higher the value of the effect size, the higher the sensitivity of the OHIP-14 to detect the change in the OHRQL will be. Cohen (31) described the probable effect sizes

according to their clinical significance as follows: 0.2 as small, ≤ 0.6 as moderate, and > 0.8 as large.

RESULTS

Of the 100 bimaxillary edentulous patients invited to participate in the study, 91% agreed to participate and completed the questionnaires before (pretreatment) and after (immediate follow-up) the installation of the dentures, and 74% completed the questionnaire at the time of discharge (intermediate control). Despite having lost 26% of patients, the men to women ratios remained the same throughout the study (**Figure 1**). Ages ranged from 40 to 85, with an average of 64 years (± 9.84) at the beginning of the study. **Table 1** shows the distribution of the population according to sex and age group.

	<i>n</i>	%
Sex		
Men	30	33.0
Women	61	67.0
Age groups		
≤ 60 years	37	40.7
> 60 years	54	59.3
Total	91	100

Table 1. Frequency distribution of the population according to demographics at the end of the study.

Global scores were 9.42 (± 7.79), 3.13 (± 4.49) and 2.13 (± 3.32) at pretreatment, immediate and intermediate follow-up, respectively. We observed a reduction of the index between the first and the second measurements, which was even greater in the third measurement. In addition, we observed that the variability in the scores in the immediate and intermediate follow-up was higher. Finally, the effect size obtained when comparing the change of the impact on QL was 0.44 after the installation of the dentures (immediate follow-up) and 0.52 after three months (intermediate follow-up). Sensitivity to change was moderate (**Table 2**).

	<i>n</i>	Mean (ST)	CV	<i>n</i>	Mean (ST)	CV	Effect size	<i>n</i>	Mean (ST)	CV	Effect size
Sex											
Men	30	8.36 (7.66)	0.86	30	3.85 (5.12)	1.43	--	22	1.93 (2.51)	1.41	--
Women	61	9.94 (7.86)	0.81	61	2.78 (4.15)	1.42	--	45	2.23 (3.67)	1.71	--
Age groups											
≤60 years	37	9.59 (8.24)	0.92	37	3.52 (5.03)	1.33	--	30	2.57 (3.62)	1.30	--
> 60 years	54	9.31 (7.54)	0.79	54	2.86 (4.11)	1.49	--	37	1.78 (3.05)	1.65	--
Total	91	9.42^a (7.79)	0.83	91	3.13^b (4.49)	1.43	0.44^{ab}	67	2.13^c (3.32)	1.56	0.52^{ac}

The letter pairs represent comparisons between the beginning and follow-up instances for the global scores.

Table 2. Global score, and score by sex and age group of the OHIP-14. Mean, standard deviation (ST) and coefficient of variation (CV) at the beginning (pretreatment), at the immediate (n=91) and intermediate follow-up (n=67).

The OHIP-14 score for both sexes decreased between the first and second measurement, but was higher among women (7.16 points), than among men (4.51 points). The largest drop between the second and third follow-up measurements was shown by men (almost 2 points) (**Figure 3**). The variability in scores by sex was similar in the two first instances of the assessment, with the variability in the intermediate follow-up being greater for women than for men (**Table 2**).

Regarding age groups, (≤ 60 years of age and > 60 years of age) both showed a similar drop in the OHIP-14 that was between 6.07 and 6.45 between the beginning and the immediate follow-up, and between 0.95 and 1.08 between the immediate and intermediate follow-up (**Figure 3**).

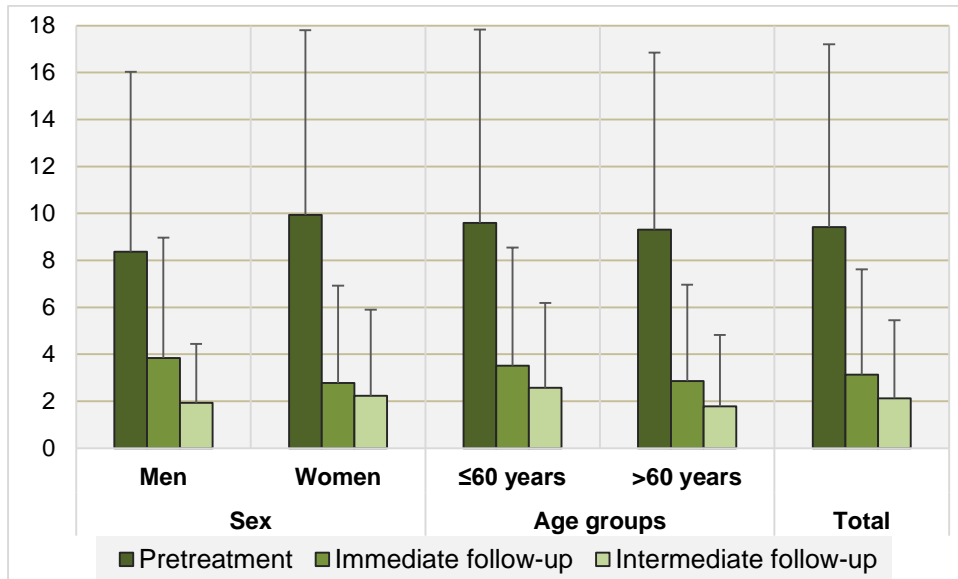


Figure 3. Global OHIP-14 scores, and scores by sex and age groups in the three instances of the assessment. The bars represent the mean scores (dark green: pretreatment, green: immediate follow-up; light green: intermediate follow-up). The black lines represent the standard deviation.

Considering the asymmetry in the distribution of OHIP-14 global scores, nonparametric comparisons were conducted of the medians at pretreatment (md=8.29) and the immediate follow-up (md=1.39) and the difference was statistically significant. We also found a statistically significant difference when comparing the medians at pretreatment and the intermediate follow-up after three months (md=0.40). However, no significant difference was found in the medians between the immediate and the intermediate follow-ups (**Table 3**).

	Md	R	n	p	n	p	n	p
				between 1 and 2		between 1 and 3		between 2 and 3
1 OHIP-14 Pretreatment	8.29 ^a	28	91		67	----	----	----
2 OHIP-14 Immediate follow-up	1.39 ^b	23.4	91	<0.001	---	----	67	----
3 OHIP-14 Intermediate follow-up	0.40 ^b	14.4			67	<0.001	67	=0.2

Md = median. R = range. Different letters indicate statistically significant differences ($p < 0.05$) between different assessment instances (Wilcoxon test).

Table 3. Comparison of the pretreatment, immediate follow-up and intermediate follow-up OHIP-14 scores.

DISCUSSION

During the care provided at the Clinic of Removable Prosthodontics in the School of Dentistry, Universidad de la República, a positive bond is formed, which often extends throughout the year, between patients, and students and faculty members. Patients feel heard, supported and understood, which generates social conditions that contribute to their quality of life, consistent with what was found in previous studies¹.

According to the current state of knowledge, it is clearly essential to include quality of life in the assessment of the outcomes of treatments performed at the dentistry clinic⁴. The care provided to completely edentulous adults at the Clinic of Complete Removable Prosthodontics in the School of Dentistry has been historically perceived as having a great social value, not just for what was mentioned above, but also due to the results regularly obtained with the dentures made. There are numerous works in the literature regarding the degree of satisfaction obtained with the dentures, but only recently has the study of the improvement in the quality of life been incorporated²⁴⁻³⁰.

Acknowledging as a weakness of this work that the OHIP-EDENT was not used, the choice of the OHIP-14 was motivated by a comparative study that indicates that the OHIP-14 places more emphasis on psychosocial factors than the GOHAI³². However, the OHIP-14 version was criticized for having a limited ability to detect the impact of QL among patients who wear complete removable dentures. To overcome this weakness, Allen and Locker²¹ created the OHIP-EDENT, and compared the ability to detect change in the OHRQL between the OHIP-14 and OHIP-EDENT through the effect size, which was small for the OHIP-14 = 0.20 and moderate for the OHIP-EDENT = 0.40 among patients treated with removable dentures. Although the main limitation of this study was not using the OHIP-EDENT instrument, which is better at detecting the change in the OHRQL in the completely edentulous population, our results showed an effect size in OHIP-14 equal to 0.44 between pretreatment and the immediate follow-up, and it increased to 0.52 between the pretreatment and the intermediate follow-ups. This showed greater sensitivity for detecting the change in OHRQL in these patients than the one reported by Allen and Locker for the OHIP-EDENT.

There are various studies in the literature that show, on the one hand, a loss of QL with edentation³³ and, on the other hand, an improvement in the quality of life when comparing the situation of completely edentulous patients before and after being rehabilitated with removable implant-supported dentures^{34,35}. However, the results are not as uniform when comparing the situation of patients with old conventional removable dentures to that of patients after receiving new or improved dentures. In this study, when comparing the global scores from before the installation of the new dentures and the ones received one month after the installation (immediate follow-up), and the ones received before and three months after the dentures were installed (intermediate follow-up), we observed a

statistically significant improvement in the impact on the QL of patients. These results contradict some authors²⁶ who claim that, although patients may need to have their dentures replaced after a wear and tear period, this does not necessarily have a significant impact on their quality of life. But they are consistent with others^{24,29,36}, who claim that most patients with complete ill-fitting dentures find moderate or full satisfaction and an improvement in chewing and confidence after the dentures are adjusted or after rehabilitation with new dentures.

Although a sample was taken for convenience reasons, all the patients treated during the clinical course of rehabilitation of complete edentulous patients in 2012 who met the inclusion criteria were invited to participate. The number of patients who participated and remained in the study enabled us to obtain representative, valid results for this population. Another limitation of this study is the fact that patients were treated by undergraduate students, which weakened the control of the interventions, so greater variability could have been introduced into the results. This was attenuated through the regular quality control of prosthetic treatments that an expert operator does on all of the works performed every year. The mean scores of the sum of the OHIP-14 values found in the answers of the patients studied were: 9.42 (pretreatment), 3.13 (immediate follow-up, after one month) and 2.13 (intermediate follow-up, after three months). The smaller difference in the improvement of QL between the immediate and intermediate follow-ups can be due to the fact that patients perceive a smaller impact when comparing the used dentures to the new ones, whereas during the period of adjustment of the new dentures there are fewer chances for comparison.

The difference between the mean QL scores between the pretreatment and immediate follow-up measurements was higher for women (7.16 points) than for men (4.51 points). This difference was maintained between the pretreatment and intermediate follow-up scores, although with a lower magnitude, being 7.71 and 6.43, respectively. These results are consistent with others from population studies in which women have higher values for the impact on the OHRQL (37-38). Although an analysis of this difference was not an objective of this study, such difference could be due to an unbalanced sex ratio in the sample studied (2:1 in favor of women).

Furthermore, we found no differences in the OHIP-14 scores in the three instances of assessments between the different age groups, which is consistent with population studies^{16,38} where elderly adults did not have a greater impact on the OHRQL versus young adults, but rather the opposite. These results expose the paradoxical association that elderly adults have a better subjective perception of their health, considering that the deterioration of oral health is a natural part of growing older. This study did not

analyze the age group as a predictor of the impact on the OHRQL, although descriptive results show that there are no differences in the perception of oral health among individuals under 60 years of age and the elderly.

CONCLUSIONS

In the last decades, the concept of quality of life appeared as an essential component in the assessment of human health. In this context, this study has contributed to enlarge the knowledge on the importance of dental care, in general, and prosthodontic care in particular, for the quality of life of completely edentulous adult patients.

Using the OHIP-14 measurement instrument, it was possible to prove, for the group being studied, that there was a significant difference on the perception of improvement of the quality of life relative to oral health after the installation of complete removable dentures. The results of the study allow us infer that, in the context of the care provided at the Clinic of Complete Removable Prosthodontics of the School of Dentistry, in the state university of Uruguay, there is a positive impact on the quality of life of completely edentulous patients treated by students.

This work is the beginning, at the School of Dentistry, Universidad de la República, of a line of research on QL connected to the rehabilitation of edentulous patients with removable dentures. Assessing the impact of rehabilitation with partial removable dentures was not within the scope of the study. Other studies that also involve partially edentulous patients are necessary in order to obtain results with a greater impact. We suggest the OHIP-EDENT instrument instead of OHIP-14 for said studies, as it is the instrument of choice.

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