ORIGINAL RESEARCH

Impact of Removable Partial Denture on Quality of Life measured after 6 Months and 1 Year of Use

[1]Kuldeep S Shekhawat, [2]Arunima Chauhan, [3]Nansi Ramalingam

ABSTRACT

Aim: To assess the impact of removable partial denture (RPD) on the quality of life in patients wearing RPD after 1 year of use.

Materials and methods: Observational study was conducted on a convenience sample of 50 patients who were delivered RPD in the Department of Prosthodontics. Oral health impact profile (OHIP-14) (translated to Tamil, but not validated) was used to measure the impact. Data were collected using telephonic interview at 6 months after the insertion of RPD (T1) and (T2) at the end of 1 year (time interval of 6 months) prospectively. Significant differences for prevalence, mean OHIP-14 scores, and extent were determined using t test.

Results: Increase in mean OHIP-14 scores and extent was observed at T1 and T2. Almost all the dimensions of OHIP-14 had higher scores at T2 except psychological discomfort. Physical pain, physical disability, and psychological disability were dimensions with significant differences (p < 0.05). A five-fold increase in proportion was observed for physical disability and psychological disability among those reporting impacts as "very often/fairly often."

Conclusion: The RPD had detrimental effect on wearer's quality of life with significant impact for painful aching in the mouth, feeling a bit embarrassed, and difficulty in chewing. Wearing RPD significantly increases the extent of impacts within a short time span of 6 months.

Clinical significance: The RPD can have a considerable impact on quality of life, which can either ameliorate or deteriorate. Patients have to be counseled periodically at subsequent recall visits and their quality of life measured, which will enable clinicians to rectify, assess, and provide adequate care to improve the overall quality of life.

Keywords: Patient satisfaction, Prevalence, Quality of life, Removable partial denture.

[1]Department of Public Health Dentistry, Srinivas Institute of Dental Sciences, Mangaluru, Karnataka, India

[2]Department of Oral Biology, Faculty of Dentistry, Melaka Manipal Medical College, Manipal University, Manipal, Karnataka, India

[3]Department of Public Health Dentistry, Indira Gandhi Institute of Dental Sciences, Puducherry, India

Corresponding Author: Arunima Chauhan, Department of Oral Biology, Faculty of Dentistry, Melaka Manipal Medical College, Manipal University, Manipal, Karnataka, India, Phone: +91-9742022860, e-mail: drarunima@rediffmail.com

INTRODUCTION

Tooth loss is the outcome of various factors, such as caries, periodontal disease, pulpal pathology, trauma, and oral cancer and may result in chewing difficulties that affect general health and quality of life.[1] With the implants gaining the momentum as the choice for prosthesis, many patients are still treated using conventional removable prosthesis. Removable partial denture (RPD) is a common treatment alternative to restore edentulous areas because it requires conservative preparations and offers rapid resolution and more accessible costs.[2]

Unfortunately, individuals wearing a removable prosthesis can experience significant problems with regard to the social and emotional aspects of life, as compared with individuals with natural teeth.[3] It may be difficult for some individuals to adapt to dentures, as wearing a removable prosthesis demands emotional and functional adjustments.[4]

Substantial interest in quantifying the consequences of disease on quality of life prompted the development of several instruments indicating the impact of oral health on quality of life. Among these, the Oral health impact profile (OHIP) is a powerful tool in oral health assessment related to quality of life.[5] The questionnaire was developed by the researchers Slade and Spencer.[6] Its original version presents 49 items and is considered a subjective indicator as it reveals individual expectations in relation to oral health. The OHIP is based on Locker's[7] conceptual model of oral health and includes seven dimensions: Functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and incapacity.[8] The OHIP-14 was developed as a modified and abbreviated version of the original OHIP and was selected as an instrument of choice to assess oral health-related quality of life (OHRQoL) in this study setting.

The aim of this study was to assess the impact on OHRQoL in patients with RPD assessed at two different time intervals with a gap of 6 months prospectively.

MATERIALS AND METHODS

This study was conducted among patients who had received RPD from the Department of Prosthodontics, Indira Gandhi Institute of Dental Sciences (IGIDS), Puducherry, India. Patients were rehabilitated by undergraduate dental students under the supervision of the Faculty of Prosthodontics. All participants received prior oral treatment and mouth preparation specific to each case. Every care was taken to maintain the state of health of biological structures. In addition, patients were instructed on care and cleaning procedures for the dentures.

Prior permission was obtained from the concerned authorities of IGIDS. A list of all the patients who received RPD was obtained from the Medical Record Department. All the patients who completed 6 months post-RPD insertion in the month of March 2015 formed the initial sample, and that time was labeled as time 1 (T1). The name, age, gender, contact number, and residential address were obtained from the records for future references. The OHIP questionnaire was applied during T1, following which it was reapplied after 6 months, i.e., September 2015 (T2). Each question of the OHIP-14 questionnaire was scored between 0 and 4 (0 = never, 1 = hardly ever, 2 = occasionally, 3 = fairly often, and 4 = very often). The scores had a possible range of 0 to 56, the higher scores representing the worse OHRQoL. The OHIP-14 prevalence was determined as the percentage of people reporting one or more OHIP-14 items, with a "very often" /"fairly often" response. The OHIP-14 extent was determined as the mean number of items reporting one or more OHIP-14 item with /"very often"/"fairly often" response. Mean OHIP-14 scores were not assessed for influence of age, gender, duration of wearing the RPD, and socioeconomic status.

A telephonic interview survey was used to obtain responses from the participants. Two compulsory rotating resident internships, who were not related to the study, were requested to interview the patients. All the interviewers were trained prior to the onset of the study on 10 randomly selected patients who were not part of the study. The pilot-tested patients were again called by the supervisor and feedback obtained from the patients. Only on satisfactory feedback by the patients were the interviewers permitted to call the sample for the study in the presence of a supervisor. The medium used was Tamil (local language). Each sampled patient was called up to three times. If the patient expressed his/her inability to respond during the call, the next call was made as per the patient's convenience, but in the working hours of the institute. On receiving the call, a standard procedure was adopted and followed. The interviewers introduced themselves to the participants and the purpose of the call explained. Patients were included in the study only when they gave verbal informed consent. It was also made clear to them that they can refuse to be a part of the survey. The response to OHIP was obtained and the participants thanked for their cooperation. Confidentiality and anonymity of their responses were assured to the participants.

The same procedure was followed when the OHIP-14 was reapplied at T2. The OHIP-14 was translated in Tamil (local language). However, the translated version was not tested for its reliability and validity. The data obtained were entered into Excel spreadsheet (Microsoft Corporation, 2013). The mean of OHIP was compared for significant differences between T1 and T2. The effect of gender and age on mean scores was determined using Student's t test using Statistical Package for the Social Sciences (version 16.0; Inc., Chicago, USA).

RESULTS

A total of 50 patients were conveniently selected and interviewed for quality of life outcomes on two different time levels (T1 and T2): T1 after 6 months of wearing RPD and T2 was subsequently followed for another 6 months, i.e., after 1 year of use. There was no loss to follow-up, and all the study participants were available at T2 when OHIP was subsequently reapplied. Males were comparatively more in number than the females, and 35 to 44-year-old participants constituted about 32% of the study population (Table 1). Almost all the dimensions had higher score at T2 than at T1 except for psychological discomfort and not statistically significant (t-test: 0.8—nonsignificant). Statistically significant difference was observed for increased mean scores at T2 for dimensions relating to physical pain, physical disability, and psychological disability (Graph 1 and Table 2).

Table 1: Distribution of participants according to age and gender

Characteristics	N (%)
Gender	
Males	28 (56)
Females	22 (44)
Age	
24–34	13 (26)
35–44	16 (32)
45–54	14 (28)
>55	7 (14)
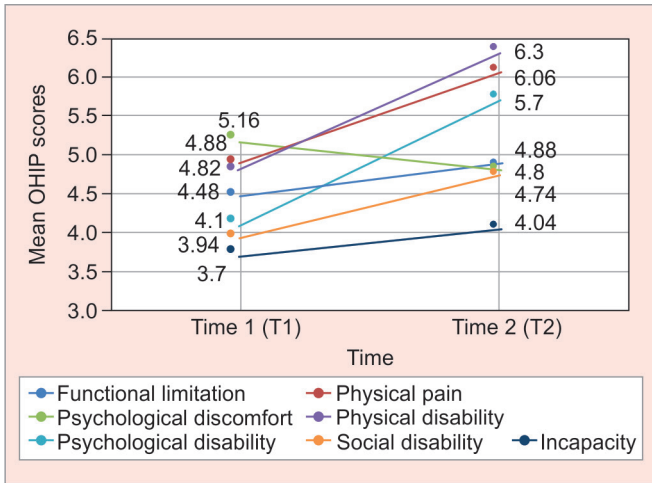
Graph 1: Mean OHIP-14 scores for each dimension in relation to time
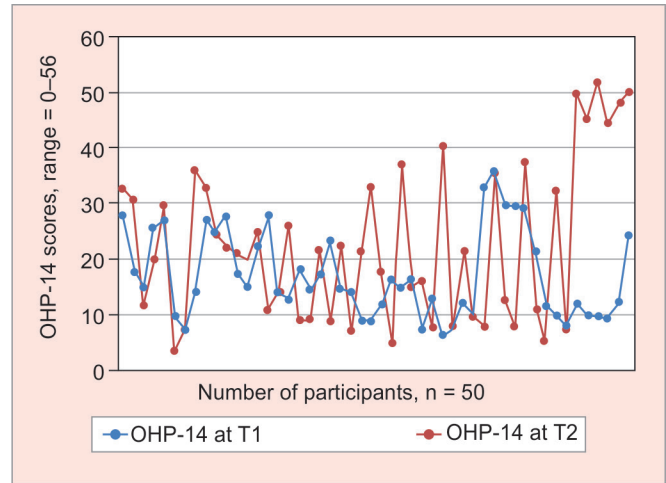
Graph 2: Individual mean OHIP-14 scores of the participants

Prevalence, Extent, and Severity of Impacts

Overall, 68% of the study participants reported one or more impacts "fairly often" or "very often" after 6 months (T1) of using RPD, which reduced to 66% after 1 year of use (T2). However, the mean number of impacts reportedly increased from 1.78 at T1 to 4.12 at T2, which was statistically significant (Table 3). Significant differences were found between mean OHIP values for T1 and T2 (higher for T2 than T1; t-test: 2.37; $p < 0.05$) (Table 3). Graph 2 represents the mean OHIP-14 scores at two different time intervals of study participants.

Trouble in pronouncing words was one item that had a major impact on quality of life at T2, among participants reporting "very often"/"fairly often" for one or more impact. This was followed by interruption during meals and being a bit embarrassed. The proportion of participants increased by five times at T2 for the items

respectively. On the contrary, a slight decrease in the proportion was observed for psychological discomfort (Table 4).

DISCUSSION

This research revealed that wearing RPD over a prolonged time period has a detrimental effect on the OHRQoL. When analyzing the influence of RPD use over a period of 6 months, we found significant differences in overall mean scores from T1 to T2 ($p < 0.05$). As evidenced by the OHIP questionnaire, there was significant increase in scores from T1 to T2, which indicates growing or increasing difficulty in adapting to RPD. Barreto et al,[9] reported the same OHRQoL after 3 months and 2 years of RPD use, indicating success in achieving patient satisfaction over a period of 2 years. Unfortunately, this was not the scenario in the study setting. Scores of individual

Table 2: Mean OHIP-14 scores of the participants in different dimensions at T1 and T2

Dimension	Number	T1	T2	T	df	p-value
Functional limitation	50	2.48 ± 1.4	2.88 ± 2.3	1.019	98	0.31
Physical pain	50	2.88 ± 1.4	4.06 ± 1.9	3.465	98	0.001*
Psychological discomfort	50	3.16 ± 1.5	2.88 ± 2.4	0.86	98	0.38
Physical disability	50	2.82 ± 1.4	4.3 ± 1.9	4.259	98	0.001*
Psychological disability	50	2.1 ± 1.8	3.7 ± 2.1	4.036	98	0.001*
Social disability	50	1.94 ± 1.8	2.74 ± 2.6	1.7	98	0.08
Handicap	50	1.74 ± 1.9	2.04 ± 2.6	0.638	98	0.525

*Level of significance at 0.05 using t-test

Table 3: Prevalence, extent, and severity scores of the participants

Variable	Respondent group		Test	df	Significance
	T1	T2			
Extent	1.78 ± 1.8	4.12 ± 4.5	3.361	98	0.01*
Severity	17.12 ± 7.8	22.52 ± 14.0	2.37	98	0.019**
Prevalence	0.68 ± 0.45	0.66 ± 0.47	0.425	98	NS

*Significant at $p < 0.01$ using t-test; **Significant at $p < 0.05$ using t-test; NS: Nonsignificant

Table 4: Proportion of participants reporting at least one impact "fairly often" and "often" at T1 and T2 (6 months)

OHIP dimensions	Number (overall)	"Fairly often" and "often" T1	T2
Functional limitation			
Had trouble pronouncing words	18	2 (1)	34 (17)
Felt that sense of taste had worsened	15	10 (5)	20 (10)
Physical pain			
Had painful aching in mouth	16	8 (4)	24 (12)
Was uncomfortable eating	26	18 (9)	34 (17)
Psychological discomfort			
Have been feeling self-conscious	34	36 (18)	32 (16)
Have felt tense	16	12 (6)	20 (10)
Physical disability			
Diet has been unsatisfactory	25	20 (10)	30 (15)
Have had to interrupt meals	25	8 (4)	42 (21)
Psychological disability			
Find it difficult to relax	25	16 (8)	34 (17)
Have been a bit embarrassed	25	8 (4)	42 (21)
Social disability			
Have been irritable with other people	20	8 (4)	32 (16)
Have had difficulty doing usual jobs	23	14 (7)	32 (16)
Handicap			
Have found life less satisfying	15	8 (4)	22 (11)
Have been totally unable to function	10	8 (4)	12 (6)

items indicated that physical pain and disability (physical and psychological) were the domains most commonly affected, with painful aching in the mouth, interrupting meals, and being embarrassed having received the most response. Locker and Quiñonez,[10] reported physical pain and psychological discomfort toward higher scores. However, in this study, no significant differences were observed in the item psychological discomfort.

There was increase in the proportion of responses of participants who experienced pain on wearing RPD during T1 and T2. Pain on wearing RPD was one of the items having an impact on quality of life. This could be an important factor in reduced chewing ability. Sheiham et al[11] and Locker[12] reported that chewing ability is a common oral health indicator among the elderly that affects general health and quality of life when unsatisfactory. Shaghaghian et al,[13] reported a similar trend of physical disability and physical pain as the most problematic aspects of OHIP-14.

A total of 34 participants (68%) reported at least one item as "very often"/"fairly often" at T1. After 6 months at T2, the same was reported by 33 participants (66%). Almost all aspects of OHIP-14 witnessed an increase in the proportion for items "very often"/"fairly often," except those feeling self-conscious where a marginal decrease was observed. This is rather an interesting

finding since studies in literature report this to be the most prominent impact.[10] Most problematic aspects at T2 were seen with psychological disability (trouble pronouncing words), functional disability (been a bit embarrassed), and physical discomfort (had to interrupt meals).

The findings of the study indicate that RPD-related problems tend to rise/aggravate with time. This is supported by significant differences observed in the mean OHIP-14 scores at two time intervals, which are 6 months apart. Significant differences were observed with OHIP-14 extent (mean number of items reporting "very often"/"fairly often"). There was a threefold increase in the extent within a short time span of 6 months. In addition, this study emphasizes that drawbacks of RPD are painful aching mouth, interruption in meals, feeling a bit embarrassed, and nonsignificant reason of trouble when pronouncing words. A slight decrease in the prevalence, but significant threefold increase in the extent can only indicate poor impact of RPD on quality of life. These factors have to be considered by the dentist and/or prosthodontist with further explanation given to the patient when the RPD treatment is planned and executed.

Acrylic resin is the most commonly used material to fabricate RPD. Shaghaghian et al[13] reported that patients wearing acrylic partial denture ranked their OHRQoL higher than those wearing metal partial denture. Barreto et al[9] reported no significant difference over a period of 2 years, indicating the carefulness with which professors and students make the prosthesis. Since metal partial dentures were not used to fabricate RPD, a higher score for OHIP-14 at T2 is observed. This to an extent refutes the possibility that care was not given by the faculty and students in the Department of Prosthodontics (study setting) when making the prosthesis. Furthermore, there is always a discrepancy between clinician objective appraisal and patient subjective preference, which cannot be ignored.[14]

This study has made an attempt to diversify into different methods for collecting data regarding OHRQoL. Whether this proves to be an efficient means to collect data or not is a hypothesis, which needs to be tested against other currently practiced means, such as questionnaire, online system, or mail. This study, according to our opinion, would have been more explanatory had we recorded OHIP-14 responses before fabricating RPD and at the time of insertion. Such a study design with regular intervals in-between would have helped us understand the entire concept in a stepwise manner.

Few limitations in our study would include: (1) Small sample size, (2) the reliability of the translated OHIP-14 (Tamil) and process of telephonic interview in the Indian scenario were not compared with other means of collecting data to find out their feasibility, (3) factors, such as gender,

age, socioeconomic status, self-reported oral health status, RPD cleaning frequency and duration of wearing the RPD and RPD stability were not asked/or reported by the study participants, and (4) number of teeth to be replaced, which is an important physical characteristic for dental patient populations, was also not considered in this study.

CONCLUSION

It can be concluded that wearing RPD has a significant impact on physical pain, physical disability, and psychological disability of the study participants. Attempts should be made by the treating clinician to help create a more positive attitude for the oral health of the patient. The RPD helps to reestablish and maintain health in the stomatological system, which improves the quality of life.

CLINICAL SIGNIFICANCE

The RPD wearers often experience significant problems with respect to social and emotional aspects of life. There are many factors correlated with better OHRQoL, which needs to be taken care of by the clinician. Since RPD satisfaction is not based on the technical quality of dentures alone, it becomes important to provide RPD according to specific needs and concerns of the patient. In addition to clinical and technical skill, gaining a better understanding of patient behavior and improving communication are crucial to improving patients' denture satisfaction.

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