

Oral Health-Related Quality of Life of Removable Partial Denture Wearers and Related Factors

Nadhirah Faiz¹, Vinay Sivasamy¹, Vishnu Priya Veeraraghavan^{2*}

¹Dept of Prosthodontics, Saveetha Dental College and hospitals, Saveetha Institute of medical and technical sciences, Saveetha University, Chennai, India

²Centre of Molecular Medicine and Diagnostics, Saveetha Dental College and hospitals, Saveetha Institute of medical and technical sciences, Saveetha University, Chennai, India

Abstract

Over 25% of the South Indian population is partial denture wearers. OHRQoL is crucial as it reflects the impact of oral health on daily functioning and overall well-being. This study investigates the oral health-related quality of life (OHRQoL) in removable partial denture (RPD) wearers in Saveetha Dental College, Chennai, using the Oral Health Impact Profile (OHIP-14). 200 RPD wearers completed questionnaires on demographic characteristics and denture-related factors, alongside the OHIP-14 questionnaire through patient interviews. OHIP-14 was interpreted using both sum and prevalence measures. The mean OHIP-14 sum was 13.80 (SD 10.08), and OHIP-14 prevalence was 44.5%. The most problematic aspects identified were physical disability and physical pain, with 27% reporting meal interruptions and 24% experiencing eating discomfort. Significant associations were found between OHRQoL and factors such as self-reported oral health, frequency of denture cleaning, and denture usage patterns (hours worn during the day, while eating, and sleeping). The study concludes that the OHRQoL of the participants was generally suboptimal and closely linked to their oral health and denture maintenance habits. This underscores the importance of improving denture care and patient education to enhance OHRQoL in RPD wearers.

Keywords: Oral Health, OHIP, Quality of Life, Removable Partial Dentures.

Introduction

Tooth loss can be caused by a variety of factors, such as trauma, periodontal disease, caries, pulpal pathology, and oral cancer. This may result in trouble chewing, which could be detrimental to general health and quality of life [1,2,3,4,5]. To replace the missing teeth, a variety of treatment options, such as dental implants, fixed bridges, or removable dentures, may be suggested. A considerable proportion of patients who have lost all of their teeth are still receiving treatment with conventional removable prostheses, even in spite of the growing acceptance of dental implants. Many people who have experienced partial tooth loss choose the removable partial denture (RPD)

due to its affordability, timely availability, and conservative design [6,7,8,9]. There are different diseased conditions have lost quality of the life [10,11].

Like other nations, Iran has experienced gains in oral health metrics, such as a decline in the population missing teeth and a corresponding decline in the need for denture therapy. Iran's population is expected to continue growing, which would lead to an increase in the number of edentulous patients. When compared to the number of edentulous patients recorded in 1975, the number of people lacking teeth (edentulous patients) is expected to increase fourfold by the year 2050 [12].

Patients who have lost all of their teeth have special needs, and it is important to consider the things that affect their quality of life [12,13]. Research has shown that a variety of factors, including biological, mechanical, cosmetic, and psychological features, can impact a prosthesis's acceptability and the efficacy of treatment [14].

Age, health, and hygiene were found to have little correlation with satisfaction; nevertheless, mastication and phonation were discovered to be major influences. Furthermore, the number of missing teeth, the fit, and the retention of removable partial dentures (RPDs) were discovered to have an impact on the happiness of those who use them [15].

Patient satisfaction varies from person to person and is frequently subjective. Furthermore, it has been shown that patients' assessments of detachable prostheses differ from those made by professionals. Variables including survival rate, prosthesis lifetime, and issue frequency are given priority by clinicians. Conversely, patients view cost-effectiveness and the social and psychological effects of treatment as more important factors [16]. One method used to assess patients' perceptions of their dental health is the dental Health Impact Profile (OHIP). It has been demonstrated to be an appropriate method of measurement and has been effectively used to measure the Oral Health-Related Quality of Life (OHRQoL) of people who wear removable dentures [17].

The OHIP questionnaire, adapted for dentistry by Locker [18], is based on a model of oral health. The original 49-item OHIP questionnaire was developed by Slade and Spencer [19], and later, the OHIP-14 was created as a shorter, modified version to assess oral health-related quality of life (OHRQoL) in the elderly [20]. There is currently a lack of research on the impact of wearing removable partial dentures (RPD) on OHRQoL among Indian patients. Therefore, this study used the OHIP-14 to investigate the OHRQoL of a sample of RPD wearers in South India.

Methods and Materials

The principal referral centre for patients in the southern region of India is Saveetha Dental College, where this cross-sectional survey was conducted in 2022. The list of all prosthodontists was obtained from Saveetha Dental College, and it included 20 practitioners in total. Additionally, the Institute Ethical Committee gave its approval. 250 patients who were referred to all of the prosthodontic offices and Saveetha Dental College were identified using a convenience sampling technique. An informative brochure detailing the study's aims and a consent form were included in the package given to the chosen participants. The following were the inclusion criteria: Patients who, with or without full dentures, have worn a single or double removable partial denture (RPD) for at least eight weeks. Patient interviews were conducted one-on-one to complete questionnaires.

There were two sections to the questionnaire. The first set of data comprised the patients' age, sex, and self-reported oral health in addition to eight categories linked to denture-associated issues. The whole set of 14 questions (the OHIP-14) was included in the next section. The instrument's validity, reliability, and accuracy were hypothesised by the authors as a means of assessing the Indian population's dental health-related quality of life [21]. Each item in the OHIP-14 questionnaire was given a score (0 = never, 1 = hardly ever, 2 = occasionally, 3 = very often, and 4 = very often). To evaluate the effect of wearing removable partial dentures (RPD) on oral health-related quality of life (OHRQoL), two metrics were used: OHIP-14 total and OHIP-14 prevalence. The scores for each of the 14 questions were added up to determine the OHIP14 total. Higher scores indicated worse OHRQoL. The possible range of the values was 0–56. The percentage of those who said they experienced one or more OHIP-14 items regularly or very frequently was used to assess the prevalence of OHIP14. An analysis of the

collected data was conducted with the SPSS software package (version 18*). The study used the chi-square test, one-way ANOVA (with Tukey post hoc test), and independent sample t-test to assess the relationship between the patients' oral health-related quality of life (OHQoL) and their demographic characteristics and denture-related parameters. The variables were incorporated into a multivariate logistic regression model, with OHIP-14 prevalence serving as the outcome variable, to reduce the impact of any confounding effects. Statistical significance was taken into account when the alpha threshold was established at 0.05.

Results

200 patients consented to take part in the study, making up 79% of the 253 people who wore RPDs and were asked to participate in the interview. Fifty-odd people, or 110 out of the total, were 50 years of age or older. In addition, 122 participants—or 61% of the total—were female. Almost 50% of them had been using their dentures for more than a year. Of the participants, 61% were satisfied with their dentures, while 43.5% reported having good oral health (table 1, figure 1).

OHRQoL of RPD Wearers

89 participants out of the total replied to at least one item with a frequency of quite often or very often. This translates to an OHIP-14 questionnaire prevalence rate of 44.5%. Regarding OHIP-14, the participants' areas of concern differed greatly. Physical disability and pain were the main issues raised by participants, with 27% and 24% of people reporting meal disruptions and discomfort during eating, respectively (table 2). By comparison, the participants had little obstacles in terms of disability and social disability; as a result, only 2.5 percent of them were unable to function, and a similar percentage had trouble doing their jobs.

Relationship between Patients' Characteristics and their OHRQoL

When taking into account the characteristics of sex, number of arches, and duration of partial removable denture use, no statistically significant relationship was found between the overall OHIP-14 scores and the prevalence of OHIP-14 scores (table 3). While there was no significant correlation found between the age and denture material parameters and the total OHIP-14 scores, there was one with the prevalence of OHIP-14 scores. Nonetheless, there was a strong correlation between denture stability and the prevalence and overall OHIP-14 scores. The patients with the lowest prevalence scores of OHIP-14 ($P < 0.001$) and OHIP-14 total were those who reported a stable and consistent experience with their dentures when speaking and chewing.

These two measures of oral health-related quality of life (OHRQoL) also showed a strong correlation with traits that represent the oral health of people who wear removable partial dentures (RPDs), such as self-reported oral health and how often dentures are cleaned. Between the prevalence and total of OHIP-14 scores and self-reported oral health, a statistically significant association was discovered. Oral health-related quality of life (OHRQoL) improved in participants with good oral health, as evidenced by their lowest ratings in both categories ($P < 0.001$). Likewise, a significant association ($P < 0.001$) was seen between the frequency of denture cleaning and the prevalence and total score of OHIP-14. A drop in OHIP-14 scores, which indicate an improvement in oral health-related quality of life, was observed when the RPD wearer increased the frequency of their denture cleanings. There was a strong correlation discovered between the two measures of oral health-related quality of life (OHRQoL) and all three criteria that reflect the frequency of denture use, including the number of hours dentures are worn in a day, wearing dentures during meals, and wearing dentures while

sleeping. The patients with the lowest Oral Health-Related Quality of Life (OHRQoL) scores were those who either didn't wear their dentures at all or wore them for a limited amount of time each day ($P < 0.001$). Patients who never wore their dentures when eating ($P < 0.001$) and sleeping ($P < 0.001$) also showed this finding.

The frequency of washing dentures, wearing dentures primarily during meals, and the oral health of those who wear removable partial dentures (RPD) are only a few of the variables that the logistic regression analysis revealed to be significantly correlated with the prevalence of OHIP-14. Compared to those who cleaned their denture once or more a day, participants who cleaned their denture less than once a day were three times more likely to regularly

experience the challenges noted in the OHIP-14 questionnaire (95% CI: 1.33-7.14). The univariate investigation found a strong correlation between all indicators of denture usage frequency and the prevalence of OHIP-14. However, the multivariate analysis did not find a statistically significant correlation between the frequency of denture usage and the prevalence of OHIP-14 and two specific indications of denture usage: wearing dentures while sleeping and for the duration of the day. Nonetheless, a strong correlation was discovered between the frequency of denture usage—more precisely, the act of wearing dentures—and the evaluation of oral health-related quality of life (as determined by OHIP-14 prevalence).

Table 1. Demographics of Partial Removable Denture Wearers

Characteristics	Number (%)	Percentage %
SEX		
Male	80	53.33333333
Female	70	47.7
Age		
<50 Years Old	60	40%
>50 Years Old	90	60%
Number of arches		
One partial Denture	90	60%
Two partial denture	52.5	35%
One partial Denture and one complete denture	7.5	5%
Duration		
<1 year	82.5	55%
>1 year	67.5	45%
Denture Material		

Only Resin	60	40%
Only Chrome - Cobalt	75	50%
One Resin and one chrome cobalt	15	10%
Hours of wearing per day		
0-3 Hours a day	30	20%
4-14 hours a day	30	20%
15-23 hours a day	60	40%
24 hours a day	30	20%
Wear when Eating		
Always	75	50%
Sometimes	53	35%
Never	22	15%
Wear when sleeping		
Always	18	12%
Sometimes	42	28%
Never	90	60%
Self reported Oral health		
Good	71	47%
fair	19	13%
poor	50	40%
Stability during Chewing and speaking		
Always stable	54	36%
Sometimes Stable	90	40%
Never stable	6	4

Table 2. Distribution of Oral Health Impact Profile – 14 (OHIP 14) for Each Single Factor

Category	Item	Very often & fairly often	Occasionally	Hardly ever & never
Functional limitation	Trouble pronouncing words	8.70%	13.00%	78.30%
	Taste worse	8.20%	20.80%	71.00%
Physical pain	Painful aching	22.60%	29.80%	47.60%
	Uncomfortable to eat	27.30%	31.80%	40.90%
Psychological discomfort	Self-conscious	8.20%	17.40%	74.40%
	Tense	22.40%	21.30%	56.30%
Physical disability	Diet unsatisfactory	24.20%	17.50%	58.30%
	Interrupt meals	29.10%	36.10%	34.80%
Psychological disability	Difficult to relax	23.00%	24.00%	53.00%
	Been embarrassed	3.60%	12.40%	84.00%
Social disability	Irritable with others	3.60%	10.10%	86.30%
	Difficulty doing jobs	2.60%	5.20%	92.20%
Handicap	Life unsatisfying	3.10%	5.70%	91.20%
	Unable to function	2.60%	4.70%	92.70%

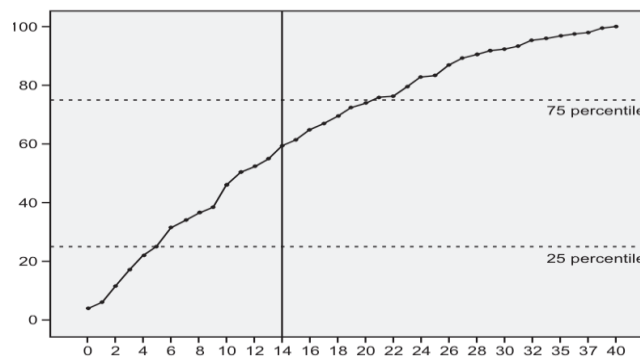


Figure 1. Cumulative Distribution of Oral Health Impact Profile-14 Scores in Removable Denture Wearers (X axis – OHIP 14 scores, Y axis – Cumulative percentage)

Table 3. Bivariate Analysis showing Factors Affecting Oral Health Related Quality of Life of Partial Removable Denture Wearers

Characteristics	OHIP Sum	OHIP Prevalence
Sex		
Male	12.9 ± 10.1 (0.213*)	33 (42%) (0.429***)
Female	14.8 ± 10.0	58 (48.7%)
Age		
<50 years old	15.7 ± 10.3 (0.047*)	46 (52%) (0.157***)
≥50 years old	12.7 ± 9.7	45 (42%)
Number of arches		
One	14.5 ± 10.6 (0.793*)	53 (49.3%) (0.383***)
Two	14.0 ± 9.4	38 (43.1%)
Duration of partial removable denture use		
≤1 year	14.3 ± 9.9 (0.635*)	49 (49.1%) (0.458***)
>1 year	13.6 ± 10.3	42 (43.8%)
Hours of wear		
0–3 h/day	25.5 ± 9.3a (<0.001**)	36 (91.7%) (<0.001***)
4–14 h/day	17.0 ± 7.5b	20 (50.7%)
15–23 h/day	9.7 ± 7.1c	24 (29.1%)
24 h/day	9.0 ± 8.8c	13 (34.4%)
Denture material		
Only resin	11.7 ± 9.4a (0.030**)	29 (38.8%) (0.131***)
Only Chrome–cobalt	15.8 ± 10.5b	57 (52.9%)

One resin and one Chrome-cobalt	13.3 ± 8.7ab	6 (37.7%)
Wear denture when eating		
Always	8.3 ± 7.1a ($<0.001^{**}$)	22 (23.4%) ($<0.001^{***}$)
Sometime	16.1 ± 8.3b	36 (53.5%)
Never	26.6 ± 8.2c	34 (99.1%)
Wear denture when sleeping		
Always	8.0 ± 7.4a (0.001 ^{**})	9 (31.6%) ($<0.001^{***}$)
Sometime	10.4 ± 8.4a	115 (27.0%)
Never	17.0 ± 10.2b	69 (58.2%)
Cleaning frequency		
0–1 time/week	26.6 ± 7.6a ($<0.001^{**}$)	33 (93.4%) ($<0.001^{***}$)
2–7 times/week	12.3 ± 8.8b	38 (40.1%)
>7 times/week	10.1 ± 7.9b	21 (31.4%)
Stability during chewing and speaking		
Always stable	7.3 ± 7.5a ($<0.001^{**}$)	14 (28.5%) (0.013 ^{***})
Sometime stable	15.9 ± 9.1b	69 (51.6%)
Never stable	19.0 ± 15.0b	10 (58.3%)
Self-reported oral health		
Good	8.3 ± 6.3a ($<0.001^{**}$)	13 (15.8%) ($<0.001^{***}$)
Fair	13.0 ± 8.2b	29 (50.3%)
Poor	24.5 ± 8.9c	50 (91.1%)

Discussion

For the majority of people, oral health has a substantial impact on quality of life because it can impair appearance, comfort, and functionality [22]. This study identifies several factors that affect the quality of life for people receiving RPD treatment. Oral health-related quality of life (OHRQoL) was observed to benefit from wearing removable partial dentures (RPD) for extended periods, cleaning the dentures more regularly, having stable dentures, and reporting good oral health. On the other hand, it was discovered that the oral health-related quality of life (OHRQoL) was only slightly impacted by variables such as sex, age, the number of dentures, length of time wearing removable partial dentures (RPD), and the material utilised for the dentures.

Although the OHIP-14 values in this study indicated that patients with removable partial dentures (RPDs) had a satisfactory oral health-related quality of life, there was a relatively high prevalence of problems connected to RPDs. This result was in line with several studies that measured patients' oral health-related quality of life for those who wore removable partial dentures (RPDs) using the OHIP [23-26]. It's possible that the features of removable partial dentures (RPD) treatment contributed to the patient's dissatisfaction. RPD treatment necessitates a large amount of clinical time, as well as constant patient monitoring and maintenance [27]. It was found that this contributed to the patient's decreased desire and low satisfaction with RPDs (removable partial dentures) [28]. This finding is consistent with a Korean study that used OHIP and found that RPD users outperformed total denture users in terms of results. Participants reported that higher levels of discomfort, limitations on social activities, and difficulties with cleaning were associated with RPD. In a similar vein, a German study found that patients who received removable partial dentures (RPD) worried about their prosthesis for a longer amount of time than patients who got permanent dental

prostheses. The most common complaints were sore spots, achy gums, denture-related discomfort, and jaw soreness. [29].

According to this study, participants who were 50 years of age or older had lower OHIP sum scores than younger participants. The research has conflicting evidence regarding how patient age affects RPD acceptability. Wakabayashi et al. [30] found that younger people typically show lower levels of aesthetic pleasure with their dentures compared to older people, which is consistent with other findings. In a similar vein, Frank et al. [31] found that patients with denture therapy report feeling less satisfied overall when they are younger than 60. Kimura et al. [32] found that the Oral Health-Related Quality of Life (OHRQoL) is lower in younger individuals receiving RPD treatment. This outcome could be attributed to the greater importance that individuals and society place on dental functioning and aesthetics, especially in comparison to older patients. On the other hand, elderly people are more experienced in adjusting to the difficulties associated with tooth loss [33]. On the other hand, Koyama et al. [34] found that the likelihood of elderly patients (those over 65) wearing their RPDs was negatively correlated with age. It was hypothesised that older people would have lower expectations for appearance and social standing and more neuromuscular function impairment, which could lead to a greater degree of therapeutic apathy.

To address the traditional issues associated with RPDs, several authors have suggested alternatives such as fixed prostheses or shortened dental arches (SDA). It is consistently observed that patients with removable prostheses have poorer oral health-related quality of life (OHRQoL) compared to those with fixed treatments. Additionally, evidence indicates that for patients with SDA, RPDs do not improve oral function or prevent craniomandibular disorders, occlusion instability, and tooth wear [35]. Furthermore, OHRQoL does not significantly differ between

RPD and SDA patients. Similar to other studies, the present study found that patients who rated their oral health as good had better OHIP scores than those who rated it as fair or poor [36]. Regular use and frequent cleaning of RPDs were associated with better OHRQoL, confirming findings from other reports that continuous RPD wearers are more satisfied with their treatment and have better OHRQoL. This suggests that acceptance of RPDs is enhanced by a positive patient attitude towards their oral health. Mineralisation of artificial substitutes like calcium carbonate, PRF, nano hydroxyapatite has shown to have clinical benefits across various fields [37-39]. Philosophical patients may be more motivated about RPD treatment and ultimately more satisfied with the outcome. There are different in silico methods to determine the pathological conditions.

The study indicates that RPD-related problems are relatively common, and factors such as the duration of RPD use, cleaning frequency, denture stability, and self-reported oral health are positively associated with better OHRQoL. These factors should be considered and communicated by clinicians when planning and executing RPD treatment. Comparing this cross-sectional study's data with that of dental individuals might be beneficial in the future. While the number of teeth is an important characteristic in dental patient populations, it was not considered in this study, which is a limitation.

Conclusion

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In conclusion, this study sheds light on the oral health-related quality of life (OHRQoL) of removable partial denture (RPD) wearers at Saveetha Dental College, Chennai. Through the use of the OHIP-14 questionnaire, it was found that the participants generally experienced suboptimal OHRQoL, with significant challenges such as physical disability and pain impacting their daily lives. The study revealed that 27% of participants reported interruptions during meals, and 24% experienced discomfort while eating, highlighting the considerable impact of RPDs on their quality of life. Importantly, the study identified strong associations between OHRQoL and factors such as self-reported oral health, denture cleaning frequency, and patterns of denture use. These findings emphasize the critical need for enhanced denture care and patient education to improve OHRQoL for RPD wearers, suggesting that targeted interventions in these areas could lead to significant improvements in their overall well-being.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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