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Original Article

Assessment of Factors Influencing Oral Health-Related Quality of Life (OHRQoL) of Patients with Acrylic Removable Partial Dental Prosthesis

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ABSTRACT

Objective: To assess oral health-related quality of life of acrylic removable partial dental prosthesis wearers and identify associated factors.

Study Design: Cross-sectional analytical study.

Place and Duration of Study: 28 Military Dental Centre, Combined Military Hospital, Lahore Pakistan, from August 2022 to January 2023.

Methodology: Eighty-three acrylic RPDP wearers were enrolled through convenient sampling. Sociodemographic and prosthesis-related data were collected using a pre-validated questionnaire, and OHRQoL was assessed with the 14-item OHIP-DENT (Likert scale 0–4). Item scores summed to give domain scores (0–8) and a total score (0–56). Data were analyzed using Statistical Package for the Social Sciences version 23; descriptive statistics, independent samples t-test and one-way ANOVA were used.

Results: Of the 83 participants, 38(45.8%) were female and 45(54.2%) male. Physical disability (4.39±1.55), psychological discomfort (4.16±1.69), and psychological disability (4.03±1.58) had the highest mean scores, whereas functional limitation had the lowest (3.23±1.76). The mean total score was 27.28±7.54 (maximum 56). Females scored higher than males on the handicap domain (4.34±1.02 vs. 3.66±1.39, p=0.016). Psychological disability (p=0.012) and handicap (p=0.015) were highest in the 40–59 years group, and handicap was higher in the high socioeconomic group (p=0.021). Functional limitation and physical pain were higher among widowed participants (p=0.010, p=0.002) and with longer prosthesis use (p=0.045, p=0.003).

Conclusion: Physical disability, psychological discomfort and psychological disability were the most affected OHRQoL domains. Age group, gender, socioeconomic status, marital status, and prosthesis duration and location were associated with specific domains, whereas education level was not.

Keywords: Acrylic Resins, Dental Prosthesis, Oral Health, Quality of Life, Removable Partial.

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INTRODUCTION

Partial edentulism is a public health concern affecting most adults worldwide. Globally, an estimated 2.3 billion people are affected by carious lesions resulting in edentulism in 19% of elderly popoulation.[1] In Pakistan, partial edentulism is reportedly common, but data remain limited.[2] Missing teeth impair mastication, speech, aesthetics and social activities, compromising quality of life.

Oral Health-Related Quality of Life (OHRQoL) emphasizes the physical, social and psychological dimensions of oral health as experienced by the patient.[3] Measuring OHRQoL has become essential to patient-centered care in prosthodontics because clinical indices alone fail to record the consequences of oral disease or rehabilitation.[4] The Oral Health Impact Profile (OHIP-14) is among the widely used validated instruments for this purpose, evaluating seven domains: functional limitation, psychological discomfort, physical pain, physical disability, social disability, psychological disability, and handicap.

Removable partial dental prostheses (RPDPs) remain one of the most common treatment option for partial edentulism in modern countries due to their relatively low cost and non-invasive nature.[5] However, evidence suggests that RPDPs may adversely affect OHRQoL due to reduced retention and stability, food accumulation, and psychosocial issues related to visible prosthesis use.[4]

Several international studies have investigated associations between OHRQoL and demographic data, prosthesis type and duration of use.[6,7] However, data from the Pakistani context remain limited, representing a noteworthy gap in the current literature. Therefore, this study was carried to assess OHRQoL using the OHIP-DENT questionnaire among

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acrylic removable partial dental prosthesis wearers and to assess the sociodemographic and prosthesis-related factors associated with it, providing a foundation for patient-centered prosthodontic care in our hospital setting.

METHODOLOGY

A cross-sectional study was conducted over six-months at 28 Military Dental Centre CMH Lahore. Ethical clearance was obtained on 28 September 2021(Ref No.107/Civ/Trg/28/09/2021). Sample size was calculated using Open Epi software, based on a mean total OHIP score of 15.62±6.6 [7], with a precision value (d) of 1.5 and confidence level of 95%, yielding a minimum required sample of 75 participants. Eighty-three participants were enrolled by convenience sampling to allow for non-response.

Inclusion Criteria: Medically healthy adults of either gender, aged above 20 till 75 years of age, who wore acrylic removable partial dental prostheses and attended the Outpatient Department were included.

Exclusion Criteria: Complete denture wearers and patients with physical or mental disability, syndromes, or congenitally missing teeth or uncontrolled systemic diseases were excluded.

Participants were briefed about the study and about confidentiality of their data. Eligible participants were recruited from the Prosthodontics Department outpatient unit after informed consent.

Data was collected using a two-part questionnaire. The first section recorded sociodemographic and prosthesis-related information, including Kennedy classification of prosthesis, location of prosthesis, duration of its use, brushing habits, night wearing habit, frequency of dental visits and hygiene status. The second section comprised the pre-validated OHIP-DENT 14-item questionnaire to assess OHRQoL.

Operational definitions: OHRQoL was defined as the patient's subjective assessment of how oral health conditions affect functional, psychological, and social well-being, measured using the OHIP-DENT 14. Acrylic removable partial dental prosthesis was defined as a prosthesis fabricated predominantly from polymethyl methacrylate (acrylic resin) designed to replace missing teeth and is supported by both remaining natural teeth and oral mucosa. Middle socioeconomic class was defined as a monthly income between PKR 40,000 and PKR 100,000.

The OHIP-DENT 14 questionnaire assesses seven domains: functional limitation, psychological discomfort, physical pain, physical disability, social disability, psychological disability, and handicap (each domain comprising of two questions). Each of the fourteen items is scored on a Likert scale from 0 to 4 (0=never, 1=hardly ever, 2=occasionally, 3=fairly often, 4=very often). For calculation of domain scores, the scores of the two items in each domain were summed (range 0–8), and the total score was the sum of all fourteen items (range 0–56). Greater cumulative scores indicate greater impact on OHRQoL.

Study parameters included sociodemographic variables (age group, gender, marital status, socio-economic status, educational level) and prosthesis-related variables (Kennedy classification, location, duration of use, night wearing, brushing habits, prosthesis hygiene, and frequency of dental visits).

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 23 (IBM Corp., Armonk, NY, USA). Normality of the continuous data (OHIP-DENT domain and total scores) was evaluated using the histogram plots, which showed almost normal distribution of the OHIP-dent scores, thus mean/standard deviations were reported along with using parametric tests for comparisons. Percentages and frequencies were presented for all categorical variables (age group, gender, marital status, education, socioeconomic status, Kennedy classification, location of prosthesis, brushing habits, duration of prosthesis use, night wearing of prosthesis, hygiene status, and frequency of dental visits). Mean and standard deviation was determined for the OHIP-DENT domain and total scores. Inferential statistics was used to identify associations between sociodemographic/prosthesis-related factors related with OHRQoL. Independent samples T-test was used to compare domain and total scores between gender, while one-way ANOVA was used to compare domain and total scores across other categorical variables, with three or more sub-groups, along with post-hoc analysis for significant associations. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

There were 83 participants enrolled in this study. Out of 83, 38(45.8%) were females and the largest proportion of participants, 33(39.8%) belonged to 40 - 59 years age group. Most participants, 57(68.7%), were married and secondary education was the most frequent education level 41(49.4%). Socioeconomic status was predominantly middle-class 46(55.4%). Sociodemographic details are summarized in Table-I.

Most participants 43(51.8%) brushed once daily, and 36(43.4%) used maxillary prostheses. Kennedy Class I was the most common prosthesis type among 26(31.3%) participants. Details of prosthesis characteristics and oral care habits are given in Table-II.

Table-I: Summary of baseline sociodemographic characteristics of study participants (n=83)

Characteristics		n(%)
Age groups	20 – 39 years	29(34.9%)
	40 – 59 years	33(39.8%)
	60 years and above	21(25.3%)
Gender	Male	45(54.2%)
	Female	38(45.8%)
Education level	Primary	13(15.7%)
	Secondary	41(49.4%)
	Higher	29(34.9%)
Marital status	Single	17(20.5%)
	Married	57(68.7%)
	Widowed	9(10.8%)
Socioeconomic status	Low	20(24.1%)
	Middle	46(55.4%)
	High	17(20.5%)

n: number of participants; % percentage

Table-II: Patient characteristics related to dental prosthesis and oral care (n=83)

Characteristics		n(%)
Kennedy Classification	Class I	26(31.3%)
	Class II	22(26.5%)
	Class III	23(27.7%)
	Class IV	12(14.5%)
Location of prosthesis	Maxillary	36(43.4%)
	Mandibular	33(39.8%)
	Both	14(16.9%)
Dental visits	Less than 1 year	36(43.4%)
	1 – 3 years	42(50.6%)
	More than 3 years	5(6.0%)
Brushing habits	Once a day	43(51.8%)
	Twice a day	21(25.3%)
	Irregular brushing	19(22.9%)
Night time wearing	No	68(81.9%)
	Yes	15(18.1%)
Denture hygiene	Satisfactory	55(66.3%)
	Unsatisfactory	28(33.7%)
Duration of prothesis	Less than 1 year	36(43.4%)
	1 – 5 years	42(50.6%)
	More than 5 years	5(6.0%)

n: number of participants; %: percentage

The OHIP-DENT questionnaire was filled by each participant, and frequency of responses for each questionnaire are given in Table-III. The OHIP-DENT domain and total mean scores are presented in Table-IV. The highest mean score was recorded in Physical disability domain (4.39±1.55), whereas the lowest mean scores were noted in the functional limitation domain (3.23±1.76).

No significant difference was found between total mean score and domain OHIP-DENT score between males and females, except handicap domain. Females had a higher domain mean score for handicap as compared to males (4.34±1.02 vs 3.66±1.39, p=0.016).

Table-III: Frequency distribution of responses to Oral Health Impact Profile–Dentate questionnaire items (n=83)

Domain	Question	0	1	2	3	4
Functional Limitation	Have you had trouble pronouncing any words because of problems with your teeth, mouth or dentures?	8(9.6)	25(30.1)	36(43.4)	13(15.7)	1(1.2)
	Have you felt that your sense of taste has worsened because of problems with your teeth, mouth or dentures?	16(19.3)	21(25.3)	35(42.2)	7(8.4)	4(4.8)
Physical Pain	Have you had painful aching in your mouth?	9(10.8)	28(33.7)	32(38.6)	12(14.5)	2(2.4)
	Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	2(2.4)	23(27.7)	29(34.9)	22(26.5)	7(8.4)
Psychological Discomfort	Have you been self-conscious because of your teeth, mouth or dentures?	0(0.0)	24(28.9)	30(36.1)	25(30.1)	4(4.8)
	Have you felt tense because of problems with your teeth, mouth or dentures?	5(6.0)	19(22.9)	30(36.1)	24(28.9)	5(6.0)
Physical Disability	Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	2(2.4)	15(18.1)	37(44.6)	26(31.3)	3(3.6)
	Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	1(1.2)	14(16.9)	39(47.0)	22(26.5)	7(8.4)
Psychological Disability	Have you found it difficult to relax because of problems with your teeth, mouth or dentures?	10(12.0)	9(10.8)	37(44.6)	25(30.1)	2(2.4)
	Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?	3(3.6)	16(19.3)	43(51.8)	17(20.5)	4(4.8)
Social Disability	Have you been irritable with other people because of problems with your teeth, mouth or dentures?	6(7.2)	18(21.7)	39(47.0)	18(21.7)	2(2.4)
	Have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?	4(4.8)	22(26.5)	41(49.4)	16(19.3)	0(0.0)
Handicap	Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	3(3.6)	12(14.5)	47(56.6)	20(24.1)	1(1.2)
	Have you been totally unable to function because of problems with your teeth, mouth or dentures?	7(8.4)	9(10.8)	50(60.2)	17(20.5)	0(0.0)

0: Never, 1: Hardly ever, 2: Occasionally, 3: Fairly often, 4: Very often, OHIP-DENT: Dentate; n(%): number (percentage) of participants

Age group was significantly associated only with the psychological disability and handicap domains; the total score did not differ significantly across age groups (p=0.058). Middle aged participants, 40–59 years old, had a greater psychological disability domain score (p=0.012) and handicap domain score (p=0.015) as shown in table IV. For both handicap and psychological disability domains, post-hoc analysis revealed significant differences between age group of 40-59 and ≥60 years (p=0.010 and p=0.002, respectively). No significant difference was observed for total mean score and domain score with respect to educational status whereas handicap domain score was highest among high socioeconomic group participants as compared to low and middle socioeconomic groups (p=0.021). Functional limitation score (p=0.010) and physical pain domain score (p=0.002) was significantly higher among widow participants as compared to married or single. For those who had been using dental prosthesis for more than five years, the mean functional limitation score (p=0.045) and physical pain score (p=0.003) was significantly higher as compared to those using

prosthesis for less than five years. Physical pain score (p=0.007) and handicap domain score (p=0.011) was higher for participants using both upper and lower dental prosthesis as compared to those with only one prosthesis. These association with duration of prosthesis is summarized in Table-V.

Table-IV: Comparison of age groups with various OHIP-DENT QoL domains

One-way ANOVA

	Overall	Age groups			*p*-value
		20-39 years (n=29)	40-59 years (n=33)	≥60 years (n=21)	
Functional limitation domain	3.23±1.76	2.80±1.70	3.30±1.60	3.60±1.80	0.272
Physical pain domain	3.74±1.75	3.20±1.60	4.00±1.60	3.90±1.90	0.191
Psychological Discomfort domain	4.16±1.69	4.20±1.80	4.30±1.60	3.80±1.50	0.504
Physical Disability domain	4.39±1.55	4.00±1.50	4.80±1.30	4.10±1.50	0.097
Psychological Disability domain	4.03±1.58	3.90±1.20	4.50±1.40	3.20±1.90	0.012
Social Disability domain	3.73±1.49	3.60±1.30	4.10±1.20	3.20±1.80	0.119
Handicap domain	3.97±1.27	3.90±1.10	4.90±1.00	3.30±1.50	0.015
Total score	27.28±7.54	25.80±5.90	29.60±6.50	25.40±9.90	0.058

Table-V: Comparison of duration of prosthesis with various OHIP-DENT QoL domains

	Overall	Duration of prosthesis			*p*-value
		<1 years (n=36)	1-5 years (n=42)	>5 years (n=05)	
Functional limitation domain	3.23±1.70	2.50±1.50	3.40±2.00	3.70±1.20	0.045
Physical pain domain	3.74±1.75	2.90±1.30	3.90±1.80	4.50±1.60	0.003
Psychological Discomfort domain	4.16±1.69	3.70±1.80	4.20±1.50	4.60±1.60	0.146
Physical Disability domain	4.39±1.55	4.10±1.60	4.30±1.50	4.70±1.50	0.486
Psychological Disability domain	4.03±1.58	3.80±1.70	3.90±1.60	4.50±1.00	0.310
Social Disability domain	3.73±1.49	3.90±1.50	3.50±1.50	3.60±1.20	0.598
Handicap domain	3.97±1.27	3.70±1.30	4.10±1.20	4.00±1.20	0.486
Total score	27.28±7.54	24.90±7.80	27.60±7.70	29.90±7.50	0.076

One-way ANOVA

DISCUSSION

Physical disability, psychological disability and psychological discomfort domains had highest mean scores, while functional limitation had the lowest mean score (mean score 3.23±1.76), wearers largely retain their ability to speak and perceive taste, whereas the physical and psychological consequences of wearing the prosthesis (interrupted meals, unsatisfactory diet, self-consciousness and embarrassment) weigh more heavily than functional concerns.

These findings are consistent with those stated by Ain *et al.,* who found higher impact on psychological and social disability domains among removable prosthesis wearers in Malaysia, with a mean OHIP-14 score of 28.3±9.1.[10] Similarly, Thangjam *et al.,* observed an impact on psychological discomfort and disability domains among complete denture wearers in India, with a (mean total OHIP score of 24.5±8.7).[11] Tariq *et al.,* reported scores falling from 33.7±9.2 preoperatively to 18.4±6.8 post-treatment following complete denture rehabilitation, underscoring the influence of prosthesis-related factors on OHRQoL in our population.[12]

Efe and Yuksek reported mean total OHIP score of 25.8±7.4, revealed psychological discomfort was a negative domain. Gender and duration of prosthesis use were found to be significant determinants of OHRQoL, partly consistent with our results (gender was associated only with the handicap domain in the present study).[13] A systematic review of Choong *et al.,* found that OHIP-14 scores significantly improved at three and six months after treatment, with the physical and psychological domains which highlights the clinical significance of addressing these domains during prosthodontic management.[14]

Middle-aged participants (40–59 years) were more affected in the handicap and psychological domains, reflecting greater social and professional demands compared with older adults, who may have adapted to their prosthesis over time. In contrast, some studies have reported a greater impact on the functional limitation domain, particularly among complete denture wearers.[15] A 2024 Saudi study by Alamoush et al. and a propensity-matched analysis by Ahmadi et al. both found that complete denture wearers had poorer OHRQoL across all domains than removable partial denture wearers, indicating that the extent of tooth loss and prosthesis type are important modifiers of OHRQoL.[16,17]

We found no significant association between educational level and OHRQoL, and socioeconomic status was associated only with the handicap (p=0.021), which was highest in the high-income group. The absence of an association with total scores accords with Ain *et al.,* who reported no significant association between these variables and OHIP-14 total scores.[10] This may indicate that the subjective experience of wearing a prosthesis is largely uniform across educational and economic strata, apart from the handicap domain, possibly because the primary determinants are the prosthesis itself and the patient's adaptation to it.

These findings show the multidimensional nature of OHRQoL in prosthesis wearers and support a patient-centered approach that goes beyond technical outcomes. Clinicians should assess OHRQoL with validated tools such as the OHIP-DENT to understand patients' lived experience and tailor treatment accordingly.[18]

CONCLUSION

Psychological disability, physical disability and psychological discomfort recorded the highest scores. Gender differed only in the handicap domain. Age group was associated with psychological disability and handicap but not with the total score. Marital status, socioeconomic status (handicap only), prosthesis location and duration of use were also associated with specific domains.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SI & NR: Data acquisition, data analysis, critical review, approval of the final version to be published.

AI & FN: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

AS: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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