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Original Article

Impact of Fixed Dental Prosthesis on Oral Health Related Quality of Life (OHRQOL)

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ABSTRACT

Objective: To determine the current oral health-related quality of life (OHRQoL) in patients with fixed dental prostheses (FDPs) using a standardized questionnaire.

Study Design: Analytical cross-sectional study.

Place and Duration of Study: Armed Forces Institute of Dentistry (AFID), Rawalpindi Pakistan, from Sep 2024 to Feb 2025.

Methodology: Adults over the age of 25, having FDPs, were asked to fill a questionnaire available in both English and Urdu languages. Socio demographic characteristics, prosthesis details, and oral health-related quality of life (OHRQoL) were assessed by 14 questions of OHIP-14. Scores were classified as good (0–28) or poor (29–56) and statistical testing was performed by using Statistical Package for the Social Sciences (SPSS).

Results: Out of 263 participants, 49.04% reported good OHRQoL, while 50.95% reported poor OHRQoL, low education (31.18% poor OHRQoL in matriculators versus 5.32% in postgraduates, $p<0.001$) and unemployment (26.99% versus 19.01% employed) were significantly associated with poor OHRQoL ($p=0.047$). Duration of prosthesis demonstrated a U-shape pattern displaying good OHRQoL during first year (18.25%) and after 10 years (5.32%) with lower outcomes during 1–10 years ($p<0.001$) with occurrence of broken teeth (38.78% with poor OHRQoL, $p<0.001$) significantly related to poor OHRQoL.

Conclusion: Almost half of FDP patients exhibited compromised OHRQoL associated with lower educational attainment, unemployment, and oral pathological conditions including toothache, periodontal disease, and broken teeth.

Keywords: Fixed Dental Prosthesis, Oral Health-Related Quality of Life, Ohip-14, Oral Hygiene Practice.

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INTRODUCTION

Fixed dental prostheses (FDPs) are the most commonly used replacement option for missing teeth[1] with the effect of FDP insertion and usage on oral health investigated in multiple studies.[2] Even if biologically compatible design and material is used, patients can still be prone to accumulation of plaque and gingival inflammation if inadequate oral hygiene practices are followed[3] as good oral hygiene habits reduce plaque accumulation and ensure optimal dental and gingival health,[4] thus, frequent dental visits and standard patient education are the key motivators that help improve oral health,[5] which is one of the most important aspects of overall well-being, substantially influencing quality of life (QOL).[6] Oral health-related quality of life (OHRQoL) is regarded as a key component of QOL, and its importance has been highlighted in various studies,[7,8] where the OHRQoL comprises of emotional, cognitive, physical, and social aspects of a person's life and using OHRQoL as a concurrent method to define treatment outcomes has several benefits, such as considering the emotional and social experiences of the individual.[9] Oral Health Impact Profile (OHIP), is one of the most commonly used tools to evaluate the impact of oral health with four different dimensions of oral health evaluated in this questionnaire, namely orofacial pain, oral function, psychosocial impact, and orofacial appearance.[10] As current literature lacks data regarding demographic details, clinical and systemic factors, and relation of patients' OHRQoL with fixed dental prosthesis (FDP), with majority of studies centered on specific prostheses types, which evaluated patients' OHRQoL concerning only a specific type of FDP. Moreover, there is scarce data available on the effect of oral hygiene practices of patients on FDP, despite it being so crucial to the longevity of prosthesis and oral health. Therefore, this study aimed to evaluate the OHRQoL of patients regarding FDP to asses' outcomes.

METHODOLOGY

The analytical cross-sectional study was conducted at the Department of Prosthodontics, Armed Forces Institute of Dentistry (AFID), Rawalpindi Pakistan, from September 2024 to February 2025 after approval from Ethics Committee and Institutional Review Board (IRB), vide letter no.

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918/Trg/13/Jan/2023. Sample size was calculated using the World Health Organisation (WHO) sample size calculator for estimating a single proportion, with a 95% confidence level (Z=1.96), an anticipated population proportion of poor OHRQoL in fixed dental prosthesis (FDP) users of 43.4%[11] and an absolute precision of 6%. Applying the standard formula for proportions, the minimum required sample size was determined to be 263 participants and non-probability sequential sampling method was used to enroll the required number of participants.

Inclusion Criteria: Patients older than 25 years, belonging to either gender, with at least one fixed dental prosthesis (FDP) in maxillary or mandibular arch, FDP that replaced one to three missing teeth were included.

Exclusion Criteria: Patients under 25 years of age, diagnosed with any syndrome, undergoing radiotherapy or chemotherapy, having neurological or psychological problems or wearing removable prosthesis along with FDP were excluded.

An informed consent form was signed by each participant and data collection was done on both digital (Google Forms) and printed copies of the data collection tool, using both English and Urdu language to assist participants. The data collection tool was self-administered, close-ended with sociodemographic information including age, gender, marital status, level of education, and employment status being recorded. The remaining questionnaire was divided into three distinct sections: first section on dental history, second section comprised of the information regarding oral hygiene practices including type, duration and frequency of tooth cleaning that patient performs while the third part comprised the OHIP-14 questionnaire which was used to evaluate participants' quality of life in relation to FDPs and comprised seven sections, namely: functional, physical pain, psychological discomfort, psychological disability, handicap, physical disability, and social disability with each section containing two questions which evaluated a specific part where minimum '0' or maximum '4' score was recorded.[12] The overall score was calculated where 0 to 28 was considered as good OHIP whereas the score from 29 to 56 was considered poor. Statistical Package for the Social Sciences (SPSS), version 22.0 was used for analyzing the data. Descriptive statistics including frequency and percentages were calculated for categorical variables comparing the OHIP score (good or poor) and demographic, oral hygiene practices, and clinical information regarding the fixed prostheses while association between these categorical variables was further analyzed using Chi-square test and a *p*-value of ≤0.05 was considered significant.

RESULTS

Out of the 263 patients with FDP, 129(49.04%) had good OHIP score and 134(50.95%) had poor OHIP score. Details of demographic, clinical and systemic factors of patient population are listed in Table-I, which shows that lower levels of education were significantly correlated with poorer OHIP scores (p<0.001), and unemployed subjects had poorer outcomes than their employed counterparts (26.99% vs 19.01% poor OHRQoL, p=0.047). Marital status was of marginal significance (p=0.013). Importantly, age (p=0.686) and gender (p=0.370) were not statistically significant concerning oral health-related quality of life outcomes in this sample.

Table-I: Demographic, Clinical and Systemic Factors of Patient Population (n=263)

Variables	Categories	n(%)
Age	≤41 years	136(51.71)
	42-55 years	80(30.42)
	>55 years	47(17.87)
Gender	Female	141(53.61)
	Male	122(46.39)
Marital Status	Married	184(69.96)
	Single	79(30.04)
Education	Bachelors	56(21.29)
	Matriculation	130(49.43)
	Postgraduate	43(16.35)
	Uneducated	34(12.93)
Occupation	Employed	102(38.78)
	Unemployed	122(46.39)
	Students	21(7.98)
	Retired	18(6.84)
Perio Disease	Yes	122(46.39)
	No	141(53.61)
Tooth Broken	Yes	150(57.03)
	No	113(42.97)
Toothache	Yes	121(46.01)
	No	142(53.99)
Duration of Recent FDP	<1 years	76(28.89)
	1-4 years	110(41.83)
	5-10 years	59(22.43)
	>10 years	18(6.84)

FDPs: Fixed Dental Prostheses

As seen in Table-II and Table-III, toothache-reporting patients had significantly worse OHIP scores (p<0.001), as did those with periodontal disease (p<0.001), while prosthesis wear time had a U-shaped

quality-of-life pattern, with best quality of life in the first year (18.25% good OHRQoL) and following more than 10 years (5.32% good OHRQoL), but significantly poorer outcomes in 1 to 10 years of use (p<0.001). A significant association was found with broken teeth, in which 38.78% of patients involved reported impaired OHRQoL while only 12.17% of those not presenting this condition did so (p<0.001).

Table-II: Association of Demographic variables with Oral Health-Related Quality of Life (OHRQoL) Based on OHIP-14 Scores Among Patients with Fixed Dental Prostheses (n=263)

Variables	Categories	OHIP Score		*p*–value
		Good n=129	Poor n=134	
Age	≤41 years	66(25.09%)	70(26.62%)	0.686
	41-55 years	42(15.97%)	38(14.45%)	
	>56 years	21(7.98%)	26(9.89%)	
Gender	Male	58(22.05%)	64(24.33%)	0.370
	Female	71(26.99%)	70(26.62%)	
Marital status	Married	99(37.64%)	85(32.32%)	0.013
	Single	30(11.41%)	49(18.63%)	
Education	Uneducated	12(4.56%)	22(8.37%)	< 0.001
	Matriculation	48(18.25%)	82(31.18%)	
	Bachelors	40(15.21%)	16(6.08%)	
	Post-graduation	29(11.03%)	14(5.32%)	
Occupation	Unemployed	51(19.39%)	71(26.99%)	0.047
	Student	15(5.70%)	6(2.28%)	
	Employed	52(19.77%)	50(19.01%)	
	Retired	11(4.18%)	7(2.66%)	

Table-III: Association Between Oral Health Conditions, Prosthesis Duration and Oral Health-Related Quality of Life (OHRQoL) Based on OHIP-14 scores Among Fixed Dental Prosthesis Patients (n=263)

Variables	Categories	OHIP Score		*p*–value
		Good n=129	Poor n=134	
Do you frequently have a toothache?	Yes	43(16.35%)	78(29.66%)	<0.001
	No	86(32.69%)	56(21.29%)	
Duration of recent fixed dental prosthesis?	<1 years	48(18.25%)	28(10.65%)	<0.001
	1-4 years	42(15.97%)	68(25.86%)	
	5-10 years	25(9.51%)	34(12.93%)	
	>10 years	14(5.32%)	4(1.52%)	
Do you have at least one broken tooth?	Yes	48(18.25%)	102(38.78%)	<0.001
	No	81(30.79%)	32(12.17%)	
Are you diagnosed with periodontal disease?	Yes	34(12.93%)	88(33.46%)	<0.001
	No	95(36.12%)	46(17.49%)	

DISCUSSION

The current research assessed the oral health-related quality of life (OHRQoL) of 263 patients with fixed dental prostheses (FDPs) and determined that 49.04% perceived good OHRQoL, whereas 50.95% experienced poor OHRQoL with significant association between OHRQoL and variables like occupation, education, dental health status, and prosthesis duration. The ratio between good and poor OHRQoL in the present study differs from a previous study, which indicated higher OHRQoL improvement (72%) following FDP treatment.[13] This may be the result of different timing of the assessment, whereas the present study measured present prostheses instead of pre-/post-treatment change yet, the current findings are in close agreement with another study, where 53% of FDP patients demonstrated enhanced OHRQoL,[14] validating the hypothesis that roughly half of prosthetic patients have ongoing quality-of-life issues. The strong association between lower education and poor OHRQoL (31.18% in matriculates vs. 5.32% in postgraduates) is consistent with evidence that education level had a significant impact on OHRQoL (p<0.001) because of health literacy differences.[15] A cross-sectional study concluded that lower educational status was strongly related to greater scores in functional limitation and physical disability subscales of the Oral Health Impact Profile (OHIP), reflecting worse oral health-related quality of life.[16] Regarding prosthesis duration, U-shaped OHRQoL pattern was observed which diverges from a previous author who noted linear OHRQoL decline over 6 years[17] but this discrepancy may stem from our inclusion of long-term (>10-year) users who may have adapted to their prostheses. The high correlation between fractured teeth and bad OHRQoL (38.78% vs. 12.17%; p<0.001) is consistent with another author, who found that 41.2% of patients with fractured teeth in FPD had compromised masticatory function (p=0.003).[18] Although better scores were noted in the natural tooth-supported group in one study, no statistical difference was noted.[19] Another study found that even though implant-supported prostheses are often linked with satisfactory results with regard to stability, comfort, aesthetics and function, the overall impact on OHRQoL is dependent on patient-related aspects.[20]

LIMITATIONS OF THE STUDY

This cross-sectional study provides valuable insights into OHRQoL among FDP patients but has several limitations. The single time-point design precludes causal inferences or assessment of longitudinal changes in OHRQoL over prosthesis lifespan. Self-reported OHIP-14 scores may introduce subjective bias, while inclusion of single-unit FDPs (crowns) may dilute findings related to true tooth replacement. The impact of FDP span and confounding factors such as dietary habits, post-cementation compliance, and follow-up adherence were not evaluated. Future longitudinal studies should track pre- and post-

insertion OHRQoL trajectories, correlate subjective scores with objective clinical parameters, and compare prosthesis types and materials to guide evidence-based practice.

CONCLUSION

Patients with fixed dental prostheses (FDP) exhibited persistent long-term impairments in oral health-related quality of life (OHRQoL), underscoring the significant influence of educational attainment, employment status, oral pathology, and systemic health on these outcomes. These findings indicate that optimizing OHRQoL necessitates a holistic, patient-centered approach that extends beyond technical prosthodontic excellence to encompass comprehensive care addressing multifaceted determinants of well-being.

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Authors' Contribution

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

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

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

SK & MS: 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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