Pak. j. life soc. Sci. (2024), 22(2): 9282-9288 E-ISSN: 2221-7630;P-ISSN: 1727-4915

Pakistan Journal of Life and Social Sciences

www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2024-22.2.00702

RESEARCH ARTICLE

Oral Health-Related Quality Of Life in Diabetic Prosthodontic Patients

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ARTICLE INFO

Received: Jul 24, 2024

Accepted: Sep 30, 2024

Keywords

OHIP-49

OHRQoL

Prosthodontic rehabilitation types

Diabetic prosthodontic patients

Dental status

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ABSTRACT

Diabetic patients display an increased risk of oral disorders, and oral health related quality of life (OHRQL) might affect their management and treatment modalities. The aim of this study was to is to assess how different forms of prosthodontic rehabilitation affect diabetic patients' oral health-related quality of life (OHRQoL).Ninety patients diagnosed with diabetes participated and were interviewed using a cross-sectional analytical design. They were grouped according to their current prosthodontic rehabilitation : The need for prosthodontic rehabilitation (NEED), complete dentures (CD), partial dentures (PD),combination of fix partial dentures (FPD) , Fixed prosthodontic rehabilitation (FIX), no need for prosthodontic rehabilitation (NO NEED). Questionnaire of OHIP 49 (Oral Health Impact Profile) was used to measure oral health quality of life (OHRQoL) on the domains of functional limitation, physical pain, psychological discomfort, physical disability , psychological disability , social disability and handicap. The analysis of OHIP of patients was performed using "Reliability Analysis" / Cronbach's Alpha .The average value of oral health impact profile in diabetic patients with complete dentures is 0.983, with partial dentures is 1.767, with combination fix partial dentures is 1.060, with fix treatment is 0.697, with prosthodontic treatment need is 1.457 and without prosthodontic treatment need is 0.498 . There is a highly significant difference between different types of prosthodontic rehabilitation and OHIP of diabetic patients (p value 0.000). Physical disability ,psychological discomfort and Handicap are three hierarchal models that have a major impact on determining quality of life and oral health in diabetic Prosthodontic patients (p-value =0.000). There is a highly significant difference between different types of prosthodontic rehabilitation and the OHIP of diabetic patients. Patients receiving removable or complete dentures had poorer OHRQoL than respondents treated with fixed prosthodontics.

INTRODUCTION

The current concept of health emphasizes not only the absence of disease, but also a complete state of well-being (Locker 1988) . When dental health is impaired due to tooth loss or any other reason, one’s function, comfort, and appearance may be impaired. Consequently, such impairment may have

a detrimental effect on psychological and social measures, such as self-confidence, social avoidance, anxiety, and emotional distress (Nordenram et al. 2013). Oral health related quality of life (OHRQoL) is a broad term which deals with such psychological, social and emotional aspects of oral health, and its effect on one's everyday life (Afshin et al. 2019). OHIP is the most widely available questionnaire for quantification of OHRQoL, which measures the seven domains of functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap (Campos et al. 2021). This questionnaire contains 49 questions which are based on the theoretical model developed by the World Health Organization (WHO) and adjusted to the measures of oral health by Locker (Slade 1997) (Klages et al. 2004) .

Diabetes mellitus is a chronic disease caused by insulin dysfunction and deficiency characterized by hyperglycemia (high blood glucose) (AD 2013) (Mouri and Badireddy 2023). Chronic hyperglycemia leads to different complications in various regions of the body including the oral cavity, so blood glucose control is very critical. The complications associated with this disease increase morbidity and mortality, impair the quality of life of patients, and have a considerable social and economic impact. Diabetes mellitus causes many immunologic and metabolic changes in the oral mucosa. Diabetes is associated with multiple oral conditions such as periodontal disease, delayed wound healing, taste alteration and oral infections (Preshaw et al. 2011) (Napeñas et al. 2020).

OHRQoL measures are used to evaluate the effect of oral conditions on quality of life and assess the effect of dental interventions (Allen 2003)(Robinson 2016). OHRQoL may be improved with prosthodontic rehabilitation in patients with partial edentulism, demonstrated by improvements in OHIP scores between baseline and follow-up (Gerritsen et al. 2010)(Anweigi et al. 2013) (McKenna et al. 2015).

Prosthodontist handle patients of all ages have to realize that this well-established metabolic disorder can have a considerable impact on the final outcome of the prosthodontic management (Varon and Mack-Shipman 2000). Diabetic patients display an increased risk of oral disorders, and oral health related quality of life (OHRQoL) might affect their management and treatment modalities (Lloyd et al. 2001).

Objective

The aim of this study is to is to assess how different forms of prosthodontic rehabilitation affect diabetic patients' oral health-related quality of life (OHRQoL) using the seven domains of the OHIP-49.

MATERIAL AND METHODS

In this study were involved 90 participants. They were voluntary selected from endocrinologic clinic of University Clinical Center of Kosovo and private clinic „ENDOCLINIC"in Prishtina. All the patients were with diabetes. Beside the general questionnaire a specific questionnaire was performed for the diabetes and Glycated hemoglobin (HbA1c) was measured. Respondents were classified according to demographic characteristics (age, gender, level of education, profession) and prosthodontic rehabilitation, following the procedures and diagnostic criteria recommended by the WHO (the WHO Oral Health Assessment Form).

Compliance statement

This study adheres to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for observational research. We have meticulously followed the STROBE Checklist to ensure comprehensive and transparent reporting of our findings. This adherence underscores our commitment to maintaining high standards of research quality and transparency.

In conducting this observational study, we adhered strictly to ethical standards and institutional guidelines. All procedures and methods employed in this study were carried out in accordance with the relevant protocols and regulations governing human research. Specifically, the study was approved by the Ethical Committee of the School of Hospital and University Clinical Service of Kosovo - University Clinical Center of Kosovo, the private endocrinological clinic ENDOCLINIC, and the prosthodontic specialistic clinic in Prishtina. The study was conducted in full accordance with the ethical principles of the World Medical Association Declaration of Helsinki, and all participants provided informed consent prior to their involvement.

The present prosthodontic rehabilitation was recorded according to the type of prosthodontic appliance that were present in the mouth: crowns, bridge ,complete denture , cast metal partial denture, acrylic partial denture and combined prosthodontic rehabilitation (bridge / denture) and we have analyzed the OHIP of the patients dividing them in groups according to prosthodontic rehabilitation: The need for prosthodontic rehabilitation (NEED), complete dentures (CD), partial dentures (PD),combination of fix partial dentures (FPD) , Fixed prosthodontic rehabilitation (FIX), no need for prosthodontic rehabilitation (NO NEED).

The impact of oral health on quality of life was estimated with the full Portuguese version of the OHIP—namely, the OHIP-49 (Pires, Ferraz and Abreu 2006). This instrument consists of 49 items arranged in 7 factors: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The answers are given in a 5-point Likert scale (0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always); 4 questions are specific for patients with dentures (questions ,Q9, Q18, and Q30) and 2 for dentate patients (questions Q13,Q14).

"Don't know" responses and blank entries were entered as missing values, which subsequently were recoded with the mean value of all valid responses question. However, if more than nine responses were left blank or marked "don't know", the questionnaire was discarded.

A summary score and the average value for all 49 items and the summary and average of each of the seven domains , were reported.

Statistical processing

The data analysis was performed in the statistical program Statistica 7.1 for Windows and SPSS Statistics 25. The following methods were used:

- The data distribution was tested with: Kolmogorov-Smirnov test; Lilliefors test; Shapiro-Wilks test (p);
- The difference in the average value of quality of life and oral health in the respondents was tested with Analysis of Variance (F / p) / Post-hoc / LSD Test and t-test for independent samples (t / p);
- The correlation: between the age of the respondents and the average value of the quality of life and oral health of the respondents was analyzed by making a Pearson (r / p) correlation coefficient; functional limitation and physical pain, physical disability and physical disability, mental disability and functional limitation are analyzed by making a Spearman Rank Order R (R / p) correlation coefficient;
- The analysis of the quality of life and oral health of the respondents was performed using "Reliability Analysis" / Cronbach's Alpha and

Significance is determined by $p < 0.05$. The data are presented in tabular and graphical form.

RESULTS

Table 1. Prosthodontic rehabilitation of the patients

Prosthodontic rehabilitation	**N=68**	**N=%**
2 complete dentures	18	26.5%
1 Complete denture	2	2.9%
Complete denture/partial denture	1	1.4%
2 partial dentures	2	2.95%
1Complete denture+fix-mobile combination	3	4.4%
2 fix mobile combination	3	4.4%
Bridges	37	54.5%
Crown	2	2.95%

In total, 90 patients participated in this study(61 female and 29 male). The mean (± SD) age of the patients was 59.58 ± 11.6 years.

During the examination we analyzed that 75.6% of the patients had one or more prosthodontic rehabilitation like crown, bridge, total or partial denture or combined rehabilitation. Prosthodontic rehabilitation type of the patients is shown in table 1.

The reliability test of OHIP-49 was statistically analyzed . A higher OHIP score is an indicator of poor oral health and a lower OHIP score indicate a good oral health. The internal consistency of the questionnaire was statistically examined, being divided into the sub-topics, according to Cronbach's alpha ($\alpha \geq 0.6$). The Cronbach's Alpha = 0.981 is very high and indicates a very internal consistency between the answers to the 49 questions regarding the Oral health impact profile of the diabetic patients.

The value of the total scores which refers to oral health impact profile of the patients varies in the interval 38.54 ± 2.86; ± 95.00% KI: 32.86-44.22; Std=27.13 and IQR=34.75;the median is 32; the minimum value is 0 and the maximum value is 153.

Dental status and OHIP49

In these study complete edentulism of upper and lower jaw was observed in 22.2% ,partial edentulism in 72.2% and full dental arch in 5.6% of patients. There is a highly significant difference between dental status and quality of life and oral health of respondents for p value 0.007.

Prosthodontic rehabilitation and OHIP49

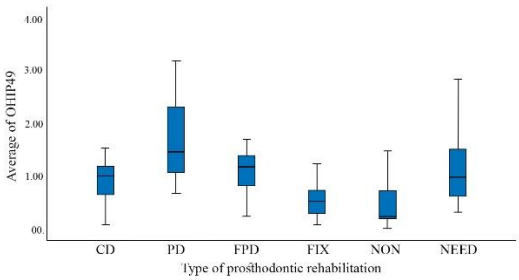

Figure 1: OHIP 49/ Prosthodontic rehabilitation

Figure 1 shows the difference in quality of life and oral health of the respondents in terms of their prosthodontic rehabilitation : The need for prosthodontic rehabilitation (NEED), complete dentures (CD), partial dentures (PD),combination of fix partial dentures (FPD) , Fixed prosthodontic rehabilitation (FIX), no need for prosthodontic rehabilitation (NO NEED). Respondents with partial denture have a lower quality of life and oral health than respondents with another prosthodontic rehabilitations due to the relationship of diabetes with periodontal and inflammatory diseases of the oral mucosa.

Table 2. OHIP49/ Prosthodontic rehabilitation

Prosthodontic status	N	Average of OHIP49	Std.Deviation	Mean Rank	Kruskal-Wallis H	Asymp. Sig.
Complete denture	21	0.983	0.507	56.10	24.183	0.000
Partial denture	3	1.767	1.29	70.67	24.183	0.000
Fix partial dentures	5	1.060	0.559	60.20	24.183	0.000
Fix	37	0.697	0.829	32.50	24.183	0.000
Need for prosthodontic	17	1.457	0.681	58.76	24.183	0.000
No prosthodontic need	7	0.498	0.513	28.93	24.183	0.000

Table 2 and Figure 1 shows the difference in quality of life and oral health of the respondents in terms of Prosthodontic rehabilitation . There is a highly significant difference between different types of prosthodontic rehabilitation and oral health impact profile of respondents (p value 0.000).

Table 3. OHIP 49/ Hierarch model

	Unstandardized Coefficients		Standardized Coefficients	
Model 7	**B**	**Std. Error**	**Beta**	**Sig.**
Physical disability	.143	.000	.167	0.000
Psychological discomfort	.143	.000	.235	0.000
Handicap	.143	.000	.138	0.000
Physical pain	.143	.000	.124	0.000
Psychological disability	.143	.000	.198	0.000
Functional limitations	.143	.000	.182	0.000
Social disability	.143	.000	.165	0.000
R	1000			
R^2	1000			
Anova	0.000			

Hierarch model categorizes factors that have the greatest impact on determining the oral health impact profile . Physical disability , Psychological discomfort and Handicap are three hierarch models that have a major impact on determining quality of life and oral health in diabetic participants (p-value =0.000). The seventh hierarchal model in terms of OHIP 49 in presented in Table 3.

DISCUSSION

Dental prosthodontic treatments may help in dealing with concerns regarding lack of aesthetics or dysfunctions, as most patients report high levels of satisfaction and increase in OHRQoL, as demonstrated in various studies (Allen and McMillan 1999) (John et al. 2004) (Ali et al. 2019). Having dental prosthesis instead of natural teeth may deteriorate patient's quality of life in a number of ways such as possible functional or aesthetics compromises, lack of retention or stability and psychological impact (Inukai et al. 2008). The average value of oral health impact profile in subjects with complete dentures is 0.983, with partial dentures is 1.767, with combination fix partial dentures is 1.06, with fix treatment is 0.697, with prosthodontic treatment need is 1.46 and without prosthodontic treatment need is 0.499 . There is a highly significant difference between different types of prosthodontic rehabilitation and oral health impact profile of respondents (p value 0.000).

CONCLUSION

Dental status has a huge impact on the quality of life and oral health of diabetic respondents. Respondents with complete and partial edentulism have a lower quality of life and oral health than respondents with a full arch status. There is a highly significant difference between different types of prosthodontic rehabilitation and the quality of life and oral health of diabetic respondents. Respondents with partial denture have a lower quality of life and oral health than respondents with another prosthodontic rehabilitations due to the relationship of diabetes with periodontal and inflammatory diseases of the oral mucosa.

Therefore, due to the relationship between some variables related to diabetes and OHRQoL, dentists can play an essential role in the awareness of diabetic patients about these problems and improve their quality of life. In addition, we recommend that visiting a dentist be part of the care protocol for diabetic patients.

AUTHOR CONTRIBUTIONS

V. Berisha Salihi , contributed to conception and design, data acquisition, analysis, and interpretation, drafted the manuscript; M.Barani Sveçla , contributed to conception, data acquisition, critically revised the manuscript; G. Kovacevska , contributed to conception, data analysis and interpretation, critically revised the manuscript about OHIP; M.Emini Sadiku , contributed to design, data interpretation, critically revised the manuscript; A.Salihi , contributed to design, data interpretation, critically revised the manuscript;All authors gave their final approval and agree to be accountable for all aspects of the work.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

FUNDING

This research was conducted without financial support from external sources.

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