

Screening of Partially Edentulous Patients using the Prosthodontic Diagnostic Index and Post-treatment Satisfaction of Fixed Partial Dentures: A Cross-sectional Survey

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ABSTRACT

Aim: The present study was conducted to understand the correlation between the severity/complexity of the prosthodontic status of the patient before the start of the fixed prosthodontic treatment as classified by the prosthodontic diagnostic index for partially edentulous patients prescribed by the ACP and the patient satisfaction post-treatment using the patient satisfaction questionnaire.

Materials and methods: An observational cross-sectional study was conducted among all the patients who underwent fixed prosthodontic treatment in the College of Dentistry, Jazan University. They were initially classified using the PDI for partially edentulous patients before treatment. A total of 128 patients were included into the study based on the inclusion criteria. The participants were interviewed post treatment using the Patient Satisfaction Questionnaire. Overall current satisfaction was calculated as the mean of current appearance, mastication, phonetics, cleansability, and cost satisfaction. The data was tabulated and subjected to statistical analysis using *t*-test and one way ANOVA.

Results: The mean satisfaction values were high for all the PDI groups, for both the males and females. The males showed overall higher mean satisfaction for all the questions compared to the females ($p > 0.05$). The PDI group 4 showed overall less mean satisfaction compared to the other groups and statistically significant lesser satisfaction compared to group 1 ($p < 0.05$).

Conclusion: Greater patient satisfaction was achieved for PDI class 1 which has less prosthodontic complexity of treatment when compared to a more complex PDI class 4. Student treatments should be limited to less complex PDI classes and clinicians with more experience are better suited to handle the more complex prosthodontic needs of the complex PDI patients.

Clinical significance: PDI classification is a useful adjunct in assessing treatment need and expected future patient satisfaction. Hence, it should be applied as a screening tool in all the clinical situations needing fixed dental prosthesis.

Keywords: Fixed dental prosthesis, Patient satisfaction, Patient satisfaction questionnaire, Prosthodontic diagnostic index.

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INTRODUCTION

Patients seek dental treatment with the aim of rehabilitation and improvement of oral health and functions. At the same time, dental treatment also aims at overall patient satisfaction. Depending upon the conditions of the patients' oral health, various removable, and fixed treatment options are available for replacing the lost teeth.¹

Fixed Dental Prosthesis (FDP) is the term used to denote the partial dentures that are cemented to the natural teeth or root, thereby furnishing and providing primary prosthesis support. Healthy occlusion with the longevity of several years can be achieved by FDP, which transforms unhealthy poor functioning dentition into a comfortable one. FDPs have been the treatment of choice to replace missing teeth for the last six decades. Owing to FDPs popularity, there is a plethora of published research in literature, however, relatively few of them deal with patients' satisfaction and their perceptions of clinical outcomes related to FDP treatment.²

Patient satisfaction is a complex and multidimensional phenomenon, much of which remains unclear.³ Patient's satisfaction with FDPs have been reported to be very high in studies conducted in various countries.⁴⁻⁸

Long-term outcome studies of fixed prosthodontic treatments give relevant information on the biologic and mechanical outcome

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of prostheses. However, there is an increasing realization that evaluation of the patient satisfaction and the worth of such treatment must be a consideration in any measure of overall prosthodontic success.^{9,10} This is particularly relevant in fixed

prosthodontic treatment, which is often perceived as expensive with limited application to the overall population.¹¹

For a successful treatment it is necessary that each patient has to be treated on the basis of their complexity and likewise referred to the respective skill level so that eventually it ends up in successful treatment with the patient being satisfied with the therapy.¹²⁻¹⁴ To ensure consistency among Prosthodontists, a system of classification was introduced by the American College of Prosthodontics (ACP).¹⁵ Recently this classification system was renamed as Prosthodontic diagnostic index (PDI).¹⁶

The present study was conducted to know the correlation between the severity/complexity of the prosthodontic status of the patient before the start of the fixed prosthodontic treatment as classified by the PDI for partially edentulous patients prescribed by the ACP and the patient satisfaction post-treatment using the patient satisfaction questionnaire.

METHODOLOGY

Study Design and Population

The present observational cross-sectional study was conducted among all the patients who underwent fixed prosthodontic treatment in the comprehensive care clinics in the academic year 2017–2018 in the College of Dentistry, Jazan University. They were initially classified using the PDI for partially edentulous patients before treatment. All the patients had received fixed prosthodontic treatment before April 2018. All the patients had been treated by dental students studying in their final year of dental school.

Ethical Clearance and Informed Consent

Ethical clearance was obtained from the Institutional Review Board, Jazan University and all the guidelines were followed. A voluntary, written informed consent was obtained from the study participants. Patients included were aged between 18 and 70 years, initially classified by PDI for partial edentulism before receiving any fixed prosthodontic treatment and should have completed the treatment 6 months prior to commencement of study. However, patients whose treatment was not complete or who received any removable prosthesis as a part of the treatment were excluded.

Out of the selected patients who were initially interviewed, 128 patients were included into the study based on the inclusion criteria. The participants were interviewed post-treatment using the Patient Satisfaction Questionnaire. Minimum 6 months duration should have been passed before introducing the questionnaire. The Patient Satisfaction Questionnaire is reliable and valid tool for assessing patient-evaluated outcomes of FDP.¹¹ The questions reflected upon mastication, phonetics, financial cost, and esthetics. The patients answered the questions using Visual analogue scale (VAS). They were directed to cross a 10 cm line at the point representing the appropriate response between the worst possible satisfaction/discontent (left anchor) and the best possible satisfaction (right anchor). A single question (yes/no response) sought whether the patients would undergo the same treatment again.

Overall current satisfaction was calculated as the mean of current appearance, mastication, phonetics, cleansability, and cost satisfaction. The patient's response was noted down by observers who were blind to the original PDI classification of the patient. The data was tabulated and subjected to statistical analysis.

Statistical Analysis

The data was analyzed using IBM SPSS v. 24.0 (IBM Statistics, SPSS, Chicago, USA), and α was set at a 5% level of significance. Student "t" test unpaired was used for comparison of mean values between males and females. Chi-Square test was used for testing the association of gender and PDI group with Q8. Intergroup (PDI groups) mean response was compared using One-Way Analysis of Variance (ANOVA) and *Post-Hoc* Scheffe test. *p* value was set at 0.05.

RESULTS

The present study assessed the patient satisfaction with FDP fabrication as per Patient satisfaction questionnaire. The study participants consisted of 58 male (45.3%) and 70 females (54.7%) with average age of 30.68 ± 8.96 years. The selected patients ($n = 128$) were classified using the PDI. PDI 1: 30 (23.4%), PDI 2: 53 (41.4%), PDI 3: 33 (25.8%), and PDI 4: 12 (9.4%) (Table 1).

Of the 128 patients, only 11 (8.6%) had a mean satisfaction score below 7.5. Therefore, majority of the participants were satisfied by the treatment they received. The average mean values for the VAS were higher among males for all questions. However, statistically significant difference between male and female participants was seen for Question no 3 which assess satisfaction with mastication (p value = 0.004) (Table 2). The mean response was different for all groups for all questions. The difference in the mean VAS score for the questions between the PDI groups was tested using the one-way ANOVA (Table 3). Significantly higher mean score was observed in group 1 compared to group 4 for Question 3 ($p = 0.005$) which assessed mastication and Question 4 ($p = 0.025$) which assessed satisfaction with speech (Table 4). No statistically significant difference was observed between the other groups for any of the question in the Patient satisfaction questionnaire. However, the patient satisfaction with their FDPs was fairly high for all the PDI groups, for both the males and females and much better in least complex cases.

DISCUSSION

The present study was conducted to know the correlation between the severity/complexity of the prosthodontic status of the patient before the start of the fixed prosthodontic treatment as classified by the PDI for partially edentulous patients prescribed by the ACP and the patient satisfaction post-treatment using the patient satisfaction questionnaire. It was observed that more than 90% of the study participants were satisfied by the FDP they had received 6 months after treatment.

Table 1: Descriptive statistics of included subjects age, gender, and PDI classification

Sex	N	%
Male	58	45.3
Female	70	54.7
Age in years (Mean \pm SD)	30.68 \pm 8.96 (Range 18–59)	
PDI		
1	30	23.4
2	53	41.4
3	33	25.8
4	12	9.4

Table 2: Gender wise questions response (mean) from patient satisfaction questionnaire

Question	Sex				p value
	Male (n = 58)		Female (n = 70)		
	Mean	SD	Mean	SD	
Q1	9.17	1.60	8.61	2.05	0.093
Q2	8.90	1.80	8.37	2.42	0.174
Q3	9.40	1.40	8.26	2.65	0.004*
Q4	9.95	0.29	9.46	1.91	0.055
Q5	9.45	1.55	9.10	2.01	0.282
Q6	9.69	0.98	9.26	2.09	0.150
Q7	9.74	0.87	9.27	2.04	0.105
Q8 (yes)	n	%	n	%	
	55	94.8	64	91.4	0.454

*p < 0.05; Significant, Student "t" test unpaired- for Q1-Q7; Chi-Square test-Q8

Table 3: Association of PDI groups with questions response (mean) from patient satisfaction questionnaire (ANOVA)

Question	PDI Group								p value
	Group 1		Group 2		Group 3		Group 4		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Q1	9.30	1.29	8.51	2.19	9.18	1.13	8.50	2.84	0.177
Q2	8.83	1.64	8.57	2.16	8.94	1.64	7.33	3.89	0.154
Q3	9.30	1.47	9.17	1.71	8.30	2.47	7.00	3.91	0.005*
Q4	9.93	0.365	9.75	1.16	9.76	1.06	8.50	3.50	0.025*
Q5	9.63	0.67	9.19	1.96	9.48	1.30	8.00	3.38	0.052
Q6	9.67	1.09	9.38	1.90	9.42	1.84	9.33	1.61	0.886
Q7	9.67	1.09	9.47	1.84	9.33	1.86	9.50	1.17	0.885

*p < 0.05; Significant

Table 4: Intergroup comparison of PDI groups with questions response (mean) from patient satisfaction questionnaire (Post-Hoc Scheffe test)

Question	PDI Group											
	Grp 1 vs 2		Grp 1 vs 3		Grp 1 vs 4		Grp 2 vs 3		Grp 2 vs 4		Grp 3 vs 4	
	Mean Diff	p value	Mean Diff	p value	Mean Diff	p value	Mean Diff	p value	Mean Diff	p value	Mean Diff	p value
Q1	0.791	0.329	0.118	0.996	0.800	0.662	0.672	0.449	0.009	1.000	0.682	0.756
Q2	0.267	0.961	0.106	0.998	1.500	0.249	0.373	0.893	1.233	0.364	1.606	0.185
Q3	0.130	0.995	0.997	0.344	2.300	0.024*	0.867	0.354	2.170	0.023	1.303	0.364
Q4	0.179	0.958	0.176	0.970	1.433	0.034*	0.003	1.00	1.255	0.055	1.258	0.076
Q5	0.445	0.755	0.148	0.991	1.633	0.071	0.296	0.905	1.189	0.231	1.485	0.112
Q6	0.289	0.907	0.242	0.956	0.333	0.954	0.047	0.999	0.044	1.00	0.091	0.999
Q7	0.195	0.966	0.333	0.886	0.167	0.993	0.138	0.986	0.028	1.00	0.167	0.993

*p < 0.05; Significant

In the present study, the Patient Satisfaction Questionnaire was used to assess the satisfaction of the patients with their fixed prosthesis. This tool was developed by Layton and Walton for assessing patient-evaluated outcomes of FDPs.¹¹ It consists of two components: Component 1 includes satisfaction with function (esthetics, mastication, phonetics, and cleansability); component 2 includes satisfaction with costs and whether patients would undergo the same treatment again. Various authors have used the PSQ for assessing the patient satisfaction and have found it highly reliable.¹⁷⁻²⁰

In the present study, more than 90% of the participants were satisfied with the fixed prosthesis they had received. This is in accordance with studies conducted by various authors, that is, the percentage of patients satisfied with fixed prosthesis has been reported to range from 74% to above 90% by Singh

V,²¹ Kasbur and Bugaighis,²² Geiballa et al.,² Creugers and Kanters⁶; Tan et al.,⁸ and Forrer et al.²³ High patient satisfaction is probably one of the major reasons for clinicians' preference for Fixed prosthesis for partially edentulous patients.

In the present study, more than 90% of the participants were satisfied with the fixed prosthesis they had received. This is in accordance with studies conducted by various authors.^{2,6,8,21-23} High patient satisfaction is probably one of the major reasons for clinicians' preference for fixed prosthesis for partially edentulous patients.

Geiballa et al.² evaluated the subjective patient satisfaction with fixed prosthesis in 192 patients and reported 84% overall satisfaction.

Creugers and Kanters⁶ carried out two long-term clinical studies on resin-bonded bridges in a total 1,484 patients and reported 82-84 % overall satisfaction with regards to function.



Tan K, Li AZ, Chan ES⁸ reported 90% satisfaction in a retrospective study in 85 patients who had received fixed partial dentures.

Singh V²¹ assessed the satisfaction level of 650 patients regarding performance of FDP and reported that 74% of the patients were satisfied by their prosthesis.

Kasbur and Bughaighis²² in their survey of 320 patients who had received fixed prosthesis (crowns, veneers, fixed partial denture, and dental implants) reported an overall satisfaction of 80.9%.

Forrer et al.²³ examined 82 patients with 158 fixed prosthesis and reported a high level of satisfaction with the esthetics and function of the crowns and FPDs.

Chaudhary et al.¹⁶ conducted a study to determine the patient satisfaction after screening and treating the completely edentulous patients on the basis of PDI. They concluded that adopting PDI led to accurate diagnosis resulting in a successful patient care. The patients were classified and referred to respective operators on the basis of level of complexity of the case in their study. The present study employed PDI for assessing the complexity of the treatment required by the participants. Significantly higher satisfaction was reported by the participants in PDI group 1 (less complexity) than PDI group 4 (highest complexity). However, in our study all the treatment was done by students of similar clinical expertise. Hence, it can be suggested that student treatments should be limited to less complex PDI classes and Prosthodontic Specialists/Senior practitioners are better suited to handle the more complex prosthodontic needs of the complex PDI patients. Further studies need to be planned in future with more number of patients.

CONCLUSION

It can be concluded that the patient satisfaction with their FDPs was fairly high for all the PDI groups, for both the males and females. The males showed overall higher mean satisfaction for all the questions compared to the females. The patients with more complex cases (PDI group 4) were less mean satisfied with their treatment compared to the other groups and significantly lesser satisfied than the patients with least complex cases (PDI group 1).

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