

Comparison of expectation and satisfaction among new and existing denture wearers and correlation of duration of previous denture-wearing experience to satisfaction in completely edentulous patients: A pilot study

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Abstract

Aim: The aim of the study was to evaluate the patients' expectation and satisfaction with complete dentures before and after the treatment concerning retention, mastication, phonetics, esthetics, and comfort among the first-time denture wearers and already denture wearers and to find the correlation between duration of denture-wearing experience and satisfaction.

Settings and Design: Cross sectional survey .

Materials and Methods: A questionnaire was given to the patient before the onset of the treatment, and ratings were given by the patient for expectation regarding retention, mastication, phonetics, esthetics, and comfort. Patient-related variables regarding previous denture experience and duration of wearing were also recorded. After the treatment was completed, the patient was asked to complete the same questionnaire to assess the satisfaction.

Statistical Analysis Used: Descriptive statistics, frequency and percentage analysis, Wilcoxon signed- rank test, Mann-Whitney U-test.

Results: Expectation and satisfaction were met for all the variables except mastication ($P = 0.004$) for first-time wearers and except mastication ($P = 0.001$) and comfort ($P = 0.007$) among existing denture wearers. However, no significant correlation was elicited between patient expectation and satisfaction in both these groups as the overall mean satisfaction percentage was similar. A clinical significance of $P = 0.037$ was seen with respect to the duration of denture-wearing experience among existing wearers. Regression model analysis showed a decreased satisfaction with increased duration of wearing ($r = 0.396$).

Conclusions: Satisfaction and expectation were found to be almost the same irrespective of whether they are first-time wearers or existing wearers. With the increase in the duration of denture-wearing experience, the satisfaction of the patients decreased.

Keywords: Denture satisfaction, duration of wearing, expectation

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INTRODUCTION

The success of prosthodontic treatment in geriatric patients is based on the general health as well as an array of dental and nondental factors. Among the nondental factors, patient satisfaction has a vital role. With accurate diagnosis and strict protocol, patient satisfaction would ensure long-term clinical results. Patient satisfaction should be given utmost importance as Devan stated appropriately that the dentist had to meet the mind of the patient before he meets the mouth of the patient.^[1] Dentist–patient communication plays an important role in satisfaction.^[2] The aim of a dentist would be not only to achieve function but also satisfaction which can be affected by various factors such as medical, functional, and psychological statuses. Thus, caring for edentulism in older patients poses a great challenge. The aim of the present study was to assess whether the expectation of a completely edentulous patient was met pertaining to factors such as retention, esthetics, mastication, phonetics, and comfort after receiving the conventional dentures. Further, this study also considered the effect of previous denture-wearing experience along with duration on patient satisfaction.

Factors attributing to patient satisfaction would be dependent on the dentist as well as the patient. From the dentist point, it included dentist–patient relationship, quality of advanced treatment options given, interpersonal communication, getting informed consent, and cost of the treatment.^[3] Factors related to the patient included quality of life affected by factors such as eating, smooth communication, physical comfort, loneliness, job, hobbies, meaningfulness, social life, and economic status.^[4] Besides, it also included the dental conditions such as adhesion and cohesion, viscosity and flow of saliva, the shape and degree of resorption of alveolar ridges, quality and quantity of alveolar bone as well as mineral density, resiliency of soft tissue, relationship between the upper and lower alveolar ridges, neuromuscular coordination, status of oral mucosa, depth of vestibular sulcus, and presence of hypertrophy of the tongue.^[5]

In a number of studies conducted over the past 30 years, the proportion of full denture patients who were dissatisfied with new and well-made prostheses was between 10% and 15%.^[6] It was found that the degree of satisfaction decreased during the first few years after insertion. Studies by Fenlon and Sherriff concluded that the initial quality of complete dentures at insertion was not a significant factor in determining patient's satisfaction with and use of these dentures 2 years after insertion.^[7] Furthermore, quality of mandibular residual ridges, retention and stability of

mandibular dentures, accuracy of reproduction of retruded jaw relationship, and patient adaptability were powerful determinants of patient satisfaction.^[8]

Sharafat *et al.*^[9] reported that the attitude toward wearing of a denture can be used as a prospective tool to measure satisfaction. Studies have shown that submandibular/sublingual salivary flow rate helped clinicians to predict denture satisfaction.^[10] Berg found that deterioration in overall satisfaction was mainly a reflection of patient opinion of the mandibular denture.^[11] Elderly females were less satisfied with conventional dentures than elderly males with respect to esthetics and ability to chew. This was proposed due to factors such as hormonal alterations, blood pressure, and psychological factors.^[12] Studies have also been conducted to assess satisfaction levels if influenced by fabrication techniques such as using different neutral zone concepts.^[13]

Earlier studies in the scientific literature aimed at finding the satisfaction after the treatment in completely edentulous patients. Nevertheless, expectation before the treatment was not evaluated. In addition, a comparison between first-time wearers and already denture wearers was not elicited which might be also an important factor in achieving patient satisfaction. Further, the duration of denture-wearing experience was not correlated with satisfaction. Hence, a study was planned to correlate the expectation of the edentulous patients before treating them and satisfaction after the treatment is done, i.e., after giving conventional dentures for first-time wearers and existing denture wearers and to find whether the duration of previous denture-wearing experience affects the level of satisfaction.

MATERIALS AND METHODS

An observational analytical cross-sectional pilot study was planned to be conducted for patients receiving conventional complete dentures with a follow-up period of 3 months in the Department of Prosthodontics, RVS Dental College, Coimbatore, Tamil Nadu, India. The study was approved by institutional review board. Fifty completely edentulous patients who sought prosthodontic treatment in the month of January 2019 were allocated for the study. It was a method of convenience sampling. They were divided into two groups as first-time denture wearers and existing denture wearers. The samples were chosen based on the inclusion and exclusion criteria. The inclusion criteria were (1) patients with both jaws edentulous (first-time denture wearers and already denture wearers who needed a new pair of dentures), (2) patients

of both the sexes, (3) patients of all ages between 38 and 70 years, and (4) patients who were able to understand and respond to the questionnaire used in the study. The exclusion criteria were (1) medically compromised patients, (2) patients suffering from psychological and neurological disorders, (3) systemic diseases, (4) patients suffering from acute or chronic symptoms of temporomandibular disorders, and (5) patients who had undergone jaw surgeries for trauma, cancer, etc. Prior permission was obtained for the study from the Institutional Ethical Review Board.

Informed consent was obtained from the patients, and they were all aware that they participated in a study. All the procedures performed in the study were conducted in accordance with the ethical standards of medical investigation involving human subjects given in the 1964 Declaration of Helsinki, as revised in 2013. Before the onset of the treatment, all the patients included in the study were given a questionnaire to be filled by them. The patients' expectation regarding the prostheses in terms of retention, mastication, phonetics, esthetics, and comfort was recorded in the questionnaire along with the previous denture-wearing experience. Both the wearers and nonwearers were questioned in their own mother tongue.

The grading was rated with the 100-mm Visual Analog Scale (VAS) using the optimum cutoff values. The Verbal Descriptive Scale (VDS) was used as the categorical criteria for VAS.¹¹⁴ To standardize, both expectation and satisfaction were rated using VDS which was based on VAS.

Conventional removable complete dentures were fabricated for all the patients in the study group by the staff (two prosthodontists involved in the study) in the department of prosthodontics using the same heat cure denture base resin material. Standardization of the clinical procedures for all the patients was done by mutual checking of all the clinical steps by both the prosthodontists. All the laboratory steps for fabrication were done by a dental technician under their supervision. After the dentures were delivered to the patients, they were all reviewed for postinsertion adjustments. All the patients were then recalled after 3 months. The same questionnaire was given to them, and now, the patients' satisfaction after the treatment completion was recorded. The results were then statistically analyzed.

Statistical Analysis

The collected data were analyzed with IBM SPSS statistics software 23.0 version (Armonk, NY: IBM Corp). To describe about the data, descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean and standard deviation were used

for continuous variables. A significant difference between the bivariate samples in paired groups (expectation and satisfaction) was evaluated with the Wilcoxon signed-rank tests, and for independent groups (previous denture wearers and nonwearers), the Mann-Whitney U-test was used. To assess the influence of duration of denture with mean satisfaction score, the linear regression model was used with the scatter plot. To find the significance in categorical data, the Chi-square test was used. Similarly, if the expected cell frequency is <5 in 2×2 tables, then the Fisher's exact test was used. In all the above statistical tools, the probability value of 0.05 is considered as statistically significant level.

RESULTS

A total of 50 edentulous patients were examined who satisfied the inclusion criteria. Among the respondents, it was found that 44% were first-time wearers and 56% were existing denture wearers [Figure 1].

The pretreatment expectation percentage of factors such as retention, mastication, esthetics, phonetics, and comfort among both the first-time wearers and the existing denture wearers is shown in Figure 2. The pretreatment expectation percentages were higher for retention (82.1%), mastication (92.9%), phonetics (64.3%), and comfort (67.9%) among the denture wearers than the nonwearers with statistical significant $P = 0.007 < 0.01$, $0.014 < 0.01$, $0.003 < 0.01$, and $0.001 < 0.01$, respectively, except for esthetics which was statistically insignificant ($P = 0.082 > 0.01$) [Table 1].

In all the above comparisons, it was found that the pretreatment expectation was found to be more in denture wearers than the first-time wearers. However, expectation for esthetics was not very significant among both the

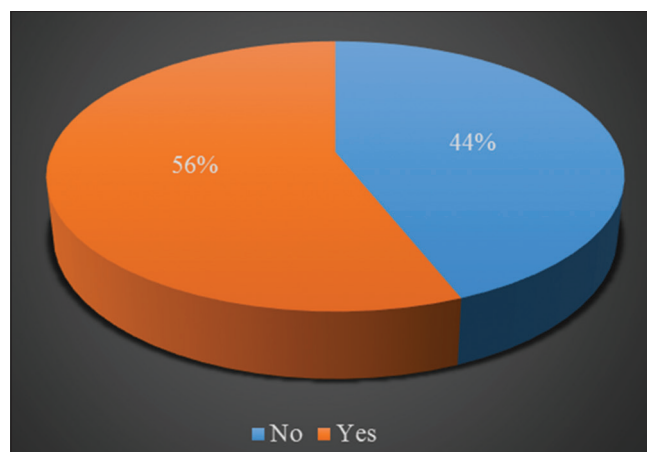


Figure 1: Distribution between wearers and nonwearers

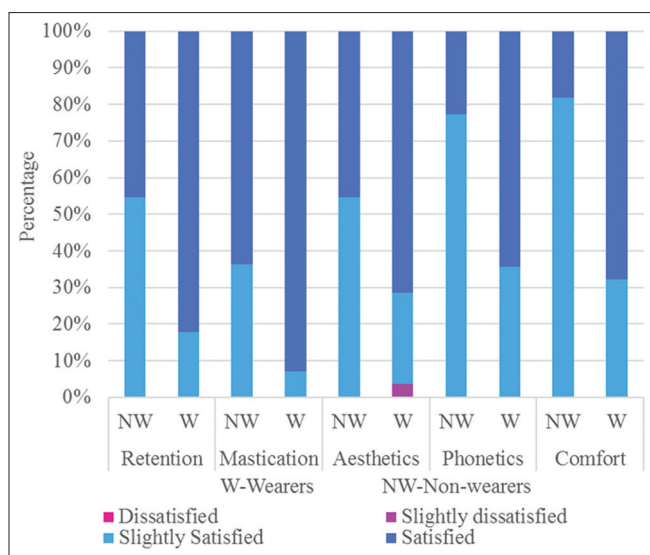


Figure 2: Graphic representation of expectation percentage among wearers and nonwearers

groups. Both the denture wearers and nonwearers had no particular expectation about esthetics.

The posttreatment satisfaction percentage of factors such as retention, mastication, esthetics, phonetics, and comfort among both the first-time wearers and the already denture wearers is shown in Figure 3. The posttreatment satisfaction percentage for retention, mastication, esthetics, phonetics, and comfort among the denture wearers and the nonwearers was almost the same with insignificant $P = 0.201, 0.874, 0.632, 0.170,$ and $0.268,$ respectively [Table 2].

It was found that in general, the expectation of the first-time wearers was found to be less than the denture wearers as determined by the Mann–Whitney test [Table 3]. In the Mann–Whitney test, the expectation of the existing wearers for retention, phonetics, and comfort was more significant followed by mastication. This showed that mastication was also an important expectation among all the factors in existing wearers. However, in contrary to the expectation, it was also the factor which was not satisfied among the existing wearers [Table 4]. Further, first-time wearers were not satisfied with retention, esthetics, phonetics, and comfort except mastication [Table 4]. Even though differences existed in numerical values for satisfaction, the overall mean satisfaction percentage was almost the same among both denture wearers and nonwearers, as shown in Figure 4 in the Mann–Whitney test. Thus, significant results were not elicited.

The Wilcoxon signed-rank test was used to evaluate the pretreatment expectation and posttreatment satisfaction for individual factors such as retention, mastication, esthetics, phonetics, and comfort among both the groups. For first-time

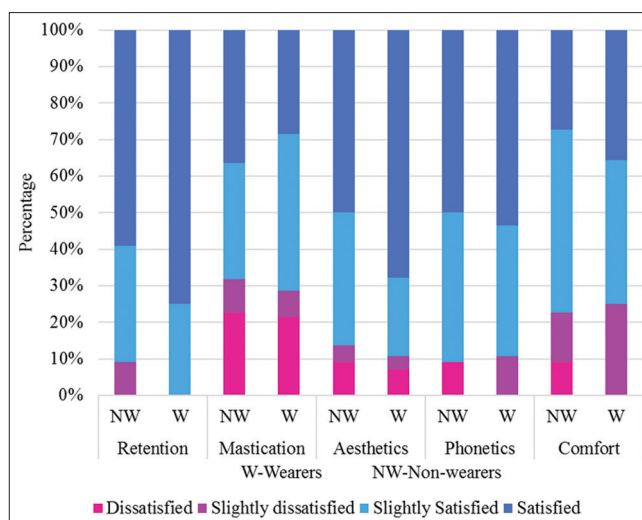


Figure 3: Graphic representation of satisfaction percentage among wearers and nonwearers

Table 1: Statistical analysis of expectation percentage among existing wearers and first-time wearers using the Chi-square test

Variables	Existing denture wearers (%)	First-time denture wearers (%)	$P < 0.01$
Retention	82.1	45.5	0.007 (significant)
Mastication	92.9	63.6	0.014 (significant)
Esthetics	71.4	45.5	0.082 (not significant)
Phonetics	64.3	22.7	0.003 (significant)
Comfort	67.9	18.2	0.001 (significant)

Table 2: Statistical analysis of satisfaction percentage among existing wearers and first-time wearers using the Chi-square test

Variables	Existing denture wearers (%)	First-time denture wearers (%)	$P < 0.01$
Retention	75	59.1	0.201 (not significant)
Mastication	36.4	28.6	0.874 (not significant)
Esthetics	67.9	50	0.632 (not significant)
Phonetics	28	22.	0.170 (not significant)
Comfort	28	22	0.268 (not significant)

wearers, pretreatment expectation and satisfaction were met for factors such as retention, esthetics, phonetics, and comfort except mastication [Table 5]. For existing denture wearers, pretreatment expectation and satisfaction were met for factors such as retention, esthetics, and phonetics except mastication and comfort [Table 6]. Although difference existed in numbers, statistical significance was noticed only for mastication. More significant results were not elicited in the Wilcoxon signed-rank tests.

The influence of duration of denture wearing with mean satisfaction score was analyzed using the linear regression model with scatter plot. With respect to the duration of denture-wearing experience among the denture wearers,

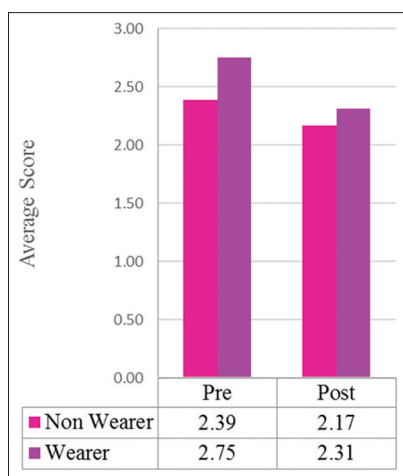


Figure 4: Graphic representation of overall mean satisfaction percentage among wearers and nonwearers

Table 3: Comparison of expectation of factors among existing wearers and first-time wearers using the Mann-Whitney test

Variables	Groups	Mean	SD	Z	P
Retention	First-time denture wearers	2.45	0.51	2.691	0.007*
	Existing denture wearers	2.82	0.39		
Mastication	First-time denture wearers	2.64	0.49	2.538	0.011†
	Existing denture wearers	2.93	0.26		
Esthetics	First-time denture wearers	2.45	0.51	1.693	0.090‡
	Existing denture wearers	2.68	0.55		
Phonetics	First-time denture wearers	2.23	0.43	2.897	0.004*
	Existing denture wearers	2.64	0.49		
Comfort	First-time denture wearers	2.18	0.39	3.463	0.001*
	Existing denture wearers	2.68	0.48		

*Highly significant $P < 0.01$, †Significant $P < 0.05$, ‡Not significant $P > 0.05$. SD: Standard deviation

Table 4: Comparison of satisfaction of factors among existing wearers and first-time wearers using the Mann-Whitney test

Variables	Groups	Mean	SD	Z	P
Retention	First-time denture wearers	2.50	0.67	1.343	0.179‡
	Existing denture wearers	2.75	0.44		
Mastication	First-time denture wearers	1.82	1.18	0.226	0.821‡
	Existing denture wearers	1.79	1.10		
Esthetics	First-time denture wearers	2.27	0.94	1.164	0.244‡
	Existing denture wearers	2.50	0.88		
Phonetics	First-time denture wearers	2.32	0.89	0.229	0.819‡
	Existing denture wearers	2.43	0.69		
Comfort	First-time denture wearers	1.95	0.90	0.46	0.646‡
	Existing denture wearers	2.11	0.79		

‡Not significant $P > 0.05$. SD: Standard deviation

it was found that there was a clinical significance of $P = 0.037$ [Table 7]. As the duration of denture-wearing experience increased, the satisfaction level decreased, as shown in Figure 5.

DISCUSSION

Previous studies did not consider the expectations before the treatment and the duration of the denture-wearing experience. In this study, we attempted to find whether the expectations of the patients were met by the treatment

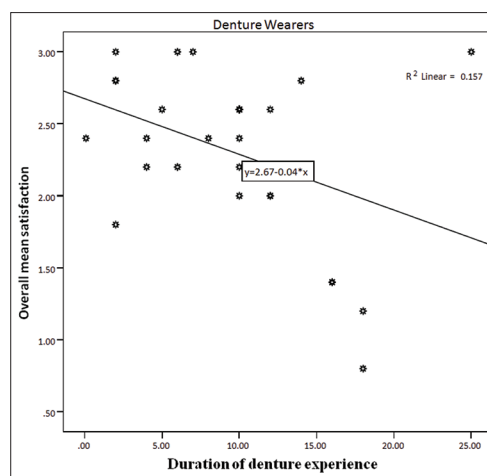


Figure 5: Linear regression model with scatter plot indicating decreased satisfaction with increased duration of wearing

done by the dentist. Patient's satisfaction has often been considered as a treatment outcome and thus with the help of a questionnaire the satisfaction was assessed.^[15] Further, it is always difficult for the dentists to treat a previous denture wearer than a first-time denture wearer. Many a times, this parameter was not taken as a significant one. This study also strived to find whether the satisfaction of a completely edentulous patient is dependent on the duration of denture wearing.

According to Sato *et al.*,^[16] overall satisfaction was highly correlated with chewing, speech, pain, esthetics, fit, retention, and comfort. Hence, these variables were used for evaluation in the present study. The questionnaire used hence was based on these variables. The questionnaire derived from this study inquired the patients about (1) the fit of the upper and lower dentures (retention), (2) the chewing efficacy with the given dentures (mastication), (3) the appearance of the dentures in their mouth with respect to color of the teeth and the denture (esthetics), (4) the ability to speak properly (phonetics), (5) the comfort feeling of the dentures, and (6) the duration of previous denture-wearing experience in a comprehensible way.

The patient was allowed to grade the expectation and satisfaction using the four-point VDS that was based on 100-mm VAS. This was used to assess patient satisfaction as it reduces the perception difference between the patient and the dentist.^[17] VDS was used to measure the patient's perception by asking him/her to choose the most appropriate status clearly expressed in words.^[14] The responses in the four-point VDS for assessment of the satisfaction level were categorised as 0 = dissatisfied, 1 = slightly dissatisfied, 2 = slightly satisfied, and 3 = satisfied. Thus, this scaled the expectation and satisfaction level of the patients. While

Table 5: Comparison of satisfaction and expectation of factors in first-time denture wearers using the Wilcoxon signed-rank tests

Factors affecting expectation and satisfaction	Mean	SD	Z	P
Retention				
Satisfaction	2.50	0.673	0.277	0.782 [‡]
Expectation	2.45	0.510		
Mastication				
Satisfaction	1.82	1.181	2.842	0.004*
Expectation	2.64	0.492		
Esthetics				
Satisfaction	2.27	0.935	0.504	0.614 [‡]
Expectation	2.45	0.510		
Phonetics				
Satisfaction	2.32	0.894	0.406	0.684 [‡]
Expectation	2.23	0.429		
Comfort				
Satisfaction	1.95	0.899	1.299	0.194 [‡]
Expectation	2.18	0.395		

*Highly significant $P < 0.01$, [‡]Not significant $P > 0.05$. SD: Standard deviation

Table 6: Comparison of satisfaction and expectation of factors in existing denture wearers using the Wilcoxon signed-rank tests

Factors affecting expectation and satisfaction	Mean	SD	Z	P
Retention				
Satisfaction	2.75	0.441	0.707	0.480 [‡]
Expectation	2.82	0.390		
Mastication				
Satisfaction	1.79	1.101	3.743	0.001*
Expectation	2.93	0.262		
Esthetics				
Satisfaction	2.50	0.882	0.698	0.485 [‡]
Expectation	2.68	0.548		
Phonetics				
Satisfaction	2.43	0.690	1.328	0.184 [‡]
Expectation	2.64	0.488		
Comfort				
Satisfaction	2.11	0.786	2.696	0.007*
Expectation	2.68	0.476		

*Highly significant $P < 0.01$, [‡]Not significant $P > 0.05$. SD: Standard deviation

Table 7: ANOVA test correlating overall satisfaction with duration of denture experience among existing denture wearers

Linear regression model for	Sum of squares	df	Mean square	F	Significance
Regression	1.401	1	1.401	4.847	0.037*
Residual	7.513	26	0.289		
Total	8.914	27			

*Predictors (Constant): Duration of denture wearing. Overall satisfaction score with respect to the duration of denture with regression model showed that overall score = Duration of denture \times (-0.039) + 2.67, which is statistically significant with $P = 0.037$ and $r = 0.396$. df: Degree of freedom

rating the expectation, almost all the patients rated with 3 as all the patients expected a pair of dentures with good retention, esthetics, phonetics, mastication, and comfort.

The sample groups involved all the patients which included both first-time denture wearers and existing wearers. In

the present study, it was found that patients had higher expectations beforehand than satisfaction after the treatment similar to studies by Gaspar *et al.*^[18] It was found naturally that the pretreatment expectations were high for both the groups for almost all factors except esthetics. This might be suggestive that all patients were more anxious about the function and comfort of the dentures rather than esthetics in contrast with a study by Ellis *et al.*^[19] which proposed that esthetics has direct initial impact on satisfaction. The expectation percentage analyzed using the Chi-square test for the variables was found to be more significant in the denture wearers than the first-time wearers except esthetics. This might be because of the previous experiences that could have slightly influenced the patient's expectation and satisfaction.^[18] Posttreatment satisfaction was same for both the groups.

Pre-treatment expectations were analyzed using the Mann–Whitney tests between the two groups. It was found that the expectation of the existing wearers for all the factors was more except esthetics. This was because functional limitation with dentures rather than appearance made them more socially handicapped.^[20] The expectation of the first-time wearers was comparatively less than the denture wearers which might be because they are probably inexperienced. However, the satisfaction percentage was almost the same among both denture wearers and nonwearers even though differences existed in expectations.

Expectation and satisfaction for all the variables for both the groups were compared using the Wilcoxon signed-rank tests. Significance elicited for mastication alone among first-time denture wearers showed that the first-time wearers were not satisfied with mastication. First-time wearers probably still needed time for adaptation to the dentures. It might also be due to the fact that their perceptions regarding new CDs were not influenced by education or previous denture experience as investigated by Miranda *et al.*^[21]

Significance elicited for both mastication and comfort among existing wearers showed that they had difficulty in both mastication and comfort. Mastication was the important parameter that was expected among both first-time wearers and existing wearers, and it was found that it was not satisfied for both the groups. This was in accordance with the study by Celebić and Knezović-Zlatarić^[22] where the patients perceived primarily the comfort and ability to masticate as satisfaction, followed by esthetics and retention. Furthermore, for existing wearers, expectation was more, and they were difficult to be

satisfied as chewing problems faced by them could have led to diminished perceived oral health that would have resulted in increase in treatment demand.^[23] The denture-wearing experience would have given them experience that affected their level of satisfaction and adaptation. The results stressed the importance of comfort without which the success rate of treating a complete denture patient will be in grave danger.

Although categorical data showed less satisfaction in terms of numbers for both the denture wearers and nondenture wearers, the mean was almost the same which implied that patient expectation and satisfaction were met. More significant results were not elicited in both the Mann–Whitney and Wilcoxon tests which might be due to the smaller sample size.

Studies by van Waas *et al.*^[24] had shown that the past denture experience was strongly associated with satisfaction. In our present study, we had investigated the correlation of the duration of denture wearing with satisfaction using the regression model analysis. As the duration of wearing increased, the satisfaction level decreased in patients. This could be due to the critical evaluation of the denture by the patient. It might also be due to tissue changes and multiple new dentures which could make their adaptive capacity difficult.^[25] This study showed that denture-wearing experience along with the duration would be a valuable prognostic factor influencing the outcome of the successful treatment of a completely edentulous patient with conventional dentures.

However, people who are edentulous for a long period of time were often more satisfied.^[26] This was explained by Sheppard as due to the deterioration of the oral condition of the patient which in turn made the patient to accept the prostheses or get used to it. Hence, a study needs to be conducted also about the period of edentulism before the denture fabrication.

Sometimes, patients disagreed for implants even at a lower cost as the patients who came to the outpatient department were mostly dependent on daily wages or their children for their living. Hence, satisfying those patients with conventional dentures became an essential requisite. Thus, the scope of this study was to find how far the patients were satisfied with prosthetic rehabilitation by conventional dentures among the patients visiting a dental college. However, advancement in implant dentistry had now allowed a transition from conventional to implant-supported dentures.^[27] Hence, the study would become more relevant in the future if done with

implant-supported dentures as the patient satisfaction was very high in implant-supported dentures than the conventional ones.^[28]

The present study had its own limitations. The sample size was around 50 edentulous patients as it was done as a pilot study. Further studies should be followed up with a larger sample size to obtain more significant results that would be clinically acceptable.

CONCLUSIONS

Within the limitations of this study, it can be concluded that

- The expectations of a completely edentulous patient with respect to factors such as retention, mastication, esthetics, phonetics, and comfort were satisfied irrespective of the fact whether they were first-time denture wearers or existing denture wearers
- With the increase in the duration of denture-wearing experience, the satisfaction level of the completely edentulous patients who wore conventional dentures decreased.

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Conflicts of interest

There are no conflicts of interest.

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