



Assessment of Patient Satisfaction and Perception with Digital and Conventional Complete Dentures: A Comparative Study

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ABSTRACT

Background: The incorporation of digital technologies in complete denture fabrication has transformed conventional prosthodontic workflows, potentially improving accuracy, efficiency, and patient comfort. However, comparative evidence on patient-centered outcomes between digital and conventional dentures is still evolving. **Aim:** To evaluate and compare patient satisfaction and perception with digital complete dentures and conventional complete dentures. **Materials and Methods:** This comparative study was conducted among 30 completely edentulous patients requiring complete denture rehabilitation. Participants were equally divided into two groups (n = 15 each). Group I received conventional complete dentures fabricated using traditional clinical and laboratory techniques, while Group II received digital complete dentures fabricated using CAD-CAM technology. Patient satisfaction and perception were assessed using a validated questionnaire evaluating parameters such as comfort, retention, stability, esthetics, mastication, phonetics, and overall satisfaction. Statistical analysis was performed using appropriate tests, with significance set at $p < 0.05$. **Results:** The digital denture group demonstrated significantly higher satisfaction scores in terms of comfort, retention, and overall satisfaction compared to the conventional denture group ($p < 0.05$). Patients receiving digital dentures also reported reduced treatment time and fewer clinical visits. However, no statistically significant differences were observed between the groups in terms of esthetics and phonetics ($p > 0.05$). **Conclusion:** Digital complete dentures showed superior patient satisfaction and perception in comparison to conventional dentures in several key parameters. The adoption of digital denture workflows may enhance clinical efficiency and patient acceptance, although larger studies with long-term follow-up are recommended.

INTRODUCTION

Complete edentulism remains a significant oral health

concern, particularly among the elderly population, affecting function, esthetics, phonetics, and overall quality

of life.¹ Conventional complete dentures have long been the standard treatment modality for edentulous patients; however, their fabrication involves multiple clinical and laboratory steps, which may be time-consuming and technique-sensitive.² Additionally, patient dissatisfaction related to retention, stability, and comfort continues to be a challenge in conventional denture therapy.³

With the advancement of digital technologies, prosthodontics has witnessed a paradigm shift toward computer-aided design and computer-aided manufacturing (CAD-CAM) systems.⁴ Digital complete dentures are fabricated using advanced scanning, designing, and milling techniques, which aim to enhance accuracy, reproducibility, and efficiency. These systems also offer advantages such as reduced chairside time, fewer patient visits, and improved standardization of denture fabrication.^{5,6}

Despite these technological benefits, the clinical success of complete dentures is largely determined by patient-centered outcomes, including satisfaction, comfort, esthetics, and functional efficiency. Patient perception plays a crucial role in the acceptance and long-term success of prosthodontic treatment.⁷ While several studies have explored the technical and clinical aspects of digital dentures, limited data are available comparing patient satisfaction and perception between digital and conventional complete dentures, especially in smaller clinical settings.

Therefore, the present study was undertaken to evaluate and compare patient satisfaction and perception with digital complete dentures and conventional complete dentures. This study aims to provide insights into the effectiveness of digital denture workflows from a patient-centered perspective and contribute to the growing body of evidence in modern prosthodontics.

MATERIALS AND METHODS

Study Design

This prospective comparative clinical study was conducted in the Department of Prosthodontics. Ethical clearance was obtained from the Institutional Ethics Committee, and the study adhered to the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrolment.

Study Population and Sample Size

A total of 30 completely edentulous patients requiring complete denture rehabilitation were included in the study. The sample size was determined based on feasibility for this pilot comparative evaluation. Patients were recruited from the outpatient department after thorough clinical examination and screening.

Inclusion and Exclusion Criteria

Patients aged between 45 and 75 years with completely

edentulous arches, adequate interarch space, and favorable ridge conditions were included in the study. Patients with severely resorbed ridges, flabby tissues, temporomandibular joint disorders, neuromuscular disorders, xerostomia, systemic conditions affecting oral mucosa, or previous implant-supported prostheses were excluded.

Randomization and Group Allocation

The selected participants were randomly divided into two groups ($n = 15$ each) using a simple randomization technique. Group I (Conventional Group) received complete dentures fabricated using conventional clinical and laboratory procedures, while Group II (Digital Group) received complete dentures fabricated using CAD-CAM technology.

Denture Fabrication Procedures

In Group I, conventional complete dentures were fabricated following standard protocols, including primary impressions with impression compound, custom tray fabrication, border molding, final impressions using zinc oxide eugenol or elastomeric materials, jaw relation records, teeth arrangement, wax try-in, and processing using heat-cured acrylic resin. The dentures were then finished, polished, and inserted.

In Group II, digital complete dentures were fabricated using a digital workflow that involved preliminary impressions or intraoral scanning, digital recording of jaw relations, virtual denture designing using CAD software, and manufacturing using CAM technology such as milling or 3D printing. The prostheses were then finished and delivered. The total number of clinical visits required for each patient was recorded.

Outcome Measures and Data Collection

Patient satisfaction and perception were evaluated one month after denture insertion using a structured and validated questionnaire. The parameters assessed included comfort, retention, stability, esthetics, mastication, phonetics, ease of adaptation, number of clinical visits, and overall satisfaction. Responses were recorded using a 5-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied).

STATISTICAL ANALYSIS

The collected data were tabulated and analyzed using Statistical Package for Social Sciences (SPSS) software (Version 25.0; IBM Corp., Armonk, NY, USA). Descriptive statistics were calculated as mean and standard deviation. Intergroup comparisons were performed using independent *t*-test for normally distributed data and Mann-Whitney *U* test for non-parametric data. Categorical variables were analyzed using Chi-square test. A *p*-value < 0.05 was considered statistically significant.

Follow-up Protocol

All patients were recalled at 24 hours, 1 week, and 1 month post-insertion for necessary adjustments and evaluation of adaptation and satisfaction.

RESULTS

A total of 30 completely edentulous patients were included in the study and equally distributed into two groups ($n = 15$ each). The comparison of patient satisfaction parameters between conventional and digital complete dentures is presented in Table 1.

The digital denture group demonstrated significantly higher mean scores for comfort (4.30 ± 0.48), retention (4.40 ± 0.50), stability (4.20 ± 0.55), mastication (4.10 ± 0.51), ease of adaptation (4.30 ± 0.47), and overall satisfaction (4.40 ± 0.49) compared to the conventional denture group (3.20 ± 0.56 , 3.10 ± 0.52 , 3.00 ± 0.60 , 3.30 ± 0.58 , 3.20 ± 0.62 , and 3.30 ± 0.50 , respectively), and the differences were statistically significant ($p < 0.05$) (Table 1). However, no

statistically significant difference was observed between the two groups with respect to esthetics and phonetics ($p > 0.05$) (Table 1).

The comparison of the number of clinical visits required for denture fabrication revealed that the digital denture group required significantly fewer visits (3.20 ± 0.41) than the conventional denture group (5.60 ± 0.50), and this difference was found to be highly statistically significant ($p < 0.001$) (Table 2).

The distribution of overall satisfaction levels showed that a higher proportion of patients in the digital denture group were “very satisfied” (53.3%) compared to the conventional group (13.3%). In contrast, a greater percentage of patients in the conventional group reported neutral or dissatisfied responses (Table 3).

Overall, the findings indicate that digital complete dentures provide superior patient satisfaction and perception compared to conventional dentures, particularly in terms of comfort, retention, and reduced treatment visits.

Table 1: Comparison of Patient Satisfaction Scores Between Groups (Mean $\pm$ SD)

Parameter	Conventional Dentures (n=15)	Digital Dentures (n=15)	p-value
Comfort	3.20 ± 0.56	4.30 ± 0.48	0.001*
Retention	3.10 ± 0.52	4.40 ± 0.50	0.000*
Stability	3.00 ± 0.60	4.20 ± 0.55	0.002*
Esthetics	3.80 ± 0.65	4.00 ± 0.63	0.210
Mastication	3.30 ± 0.58	4.10 ± 0.51	0.003*
Phonetics	3.70 ± 0.55	3.90 ± 0.50	0.180
Ease of Adaptation	3.20 ± 0.62	4.30 ± 0.47	0.001*
Overall Satisfaction	3.30 ± 0.50	4.40 ± 0.49	0.000*

Table 2: Comparison of Clinical Visits Between Groups

Parameter	Conventional Dentures	Digital Dentures	p-value
Number of Visits (Mean $\pm$ SD)	5.60 ± 0.50	3.20 ± 0.41	0.000*

Table 3: Overall Satisfaction Distribution (Frequency %)

Satisfaction Level	Conventional (n=15)	Digital (n=15)
Very Satisfied	2 (13.3%)	8 (53.3%)
Satisfied	5 (33.3%)	5 (33.3%)
Neutral	4 (26.7%)	2 (13.3%)
Dissatisfied	3 (20.0%)	0 (0%)
Very Dissatisfied	1 (6.7%)	0 (0%)

DISCUSSION

The present study aimed to evaluate and compare patient

satisfaction and perception between digital and conventional complete dentures. The findings demonstrated that patients rehabilitated with digital complete dentures

reported significantly higher satisfaction levels in terms of comfort, retention, stability, mastication, ease of adaptation, and overall satisfaction compared to those receiving conventional dentures.

The improved satisfaction observed in the digital denture group can be attributed to the enhanced precision and accuracy of CAD-CAM fabrication techniques. Digital workflows minimize errors associated with conventional impression and processing techniques, resulting in better adaptation of the denture base to the underlying tissues. This improved fit may explain the higher scores for retention and stability observed in the present study. Additionally, the uniform material properties and reduced polymerization shrinkage associated with milled denture bases may contribute to improved clinical performance and patient comfort.^{8,9}

Another important finding of the present study was the significantly reduced number of clinical visits required for the fabrication of digital dentures. This is consistent with previous studies that have highlighted the efficiency of digital workflows in reducing chairside time and improving patient convenience. Fewer appointments not only enhance patient compliance but also reduce the overall treatment burden, particularly for elderly patients who may have mobility or systemic health limitations.¹⁰⁻¹²

Despite the advantages observed with digital dentures, no statistically significant difference was found between the two groups in terms of esthetics and phonetics. This may be due to the fact that both conventional and digital techniques allow for adequate customization of tooth arrangement and occlusion, leading to comparable outcomes in these parameters.^{13,14} Furthermore, phonetic adaptation depends on neuromuscular coordination and patient adaptation, which may not differ significantly between the two fabrication techniques.

The higher overall satisfaction reported in the digital denture group is in agreement with findings from previous studies that emphasize the role of digital technology in enhancing patient-centered outcomes. The ability to store digital records, reproduce prostheses, and standardize procedures further supports the growing adoption of digital dentures in modern prosthodontics.

However, certain limitations must be considered while interpreting the results of this study. The sample size was relatively small ($n = 30$), which may limit the generalizability of the findings. The follow-up period was also short, and long-term evaluation of denture performance and patient satisfaction was not assessed. Additionally, factors such as cost-effectiveness and clinician expertise, which may influence the adoption of digital dentures, were not evaluated.

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

digital complete dentures offer superior patient satisfaction and perception in several clinical parameters compared to conventional dentures. Future studies with larger sample sizes, longer follow-up periods, and multicentric designs are recommended to validate these findings and further explore the long-term benefits of digital denture technology.

CONCLUSION

Within the limitations of this comparative study, digital complete dentures demonstrated superior patient satisfaction and perception compared to conventional complete dentures, particularly in terms of comfort, retention, stability, mastication, ease of adaptation, and overall satisfaction. Additionally, digital denture fabrication required significantly fewer clinical visits, enhancing treatment efficiency and patient convenience.

However, no significant differences were observed between the two groups with respect to esthetics and phonetics. While digital dentures show promising advantages, further studies with larger sample sizes and long-term follow-up are recommended to validate these findings and assess their long-term clinical performance.

Overall, the integration of digital workflows in complete denture fabrication represents a valuable advancement in prosthodontics, offering improved patient-centered outcomes and streamlined clinical procedures.

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