Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol.14, Issue 33s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Comparative Analysis of Patient Satisfaction with Conventional vs. Digitally Fabricated Complete Dentures in Pakistan.

Syed Muhammad Abdullah[1], Mubashra Iqbal[2], Iqra Shahzad[3], Ahmed Mujtaba Ghauri[4], Ayousha Iqbal[5], Abdullah Karamat[6], Nabiha Naeem[7]

[1]M-Phil Physiology Scholar, Demonstrator maxillofacial surgery, Azra Naheed Dental College, Superior University, Lahore, Pakistan

[2]BDS, Demonstrator, Medical Education, University Medical and Dental College, Faisalabad, Pakistan

[3]Demonstrator Prosthodontics, Azra Naheed Dental College, Lahore, Pakistan

[4]Demonstrator, Azra Naheed Dental College (Superior University, Lahore, Pakistan

[5]Associate Professor and Head of Department of Dental Materials, Islamabad Medical and Dental College, Islamabad, Pakistan

[6]BDS, FCPS (Prosthodontics), CHPE, Department of Prosthodontics, Azra Naheed Dental College, Superior University, Lahore, Pakistan

[7]Department of Life Sciences, School of Science, University of Management and Technology, (UMT), Lahore, Pakistan

Corresponding Author:

Nabiha Naeem,

Department of Life Sciences, School of Science, University of Management and Technology, (UMT), Lahore, Pakistan.

Email: nabiha.naeem@umt.edu.pk

Cite this paper as: Syed Muhammad Abdullah, Mubashra Iqbal, Iqra Shahzad, Ahmed Mujtaba Ghauri, Ayousha Iqbal, Abdullah Karamat, Nabiha Naeem (2025) Comparative Analysis of Patient Satisfaction with Conventional vs. Digitally Fabricated Complete Dentures in Pakistan..Journal of Neonatal Surgery, 14, (33s) 502-507

ABSTRACT

Background: Complete dentures are still a popular treatment modality in patients with edentulous problems. The latest developments in digital dentistry especially, the CAD/CAM technology, have provided a digitally manufacturated complete denture, which might have better fit, comfort and patient satisfaction than the traditional fabrication technique.

Objective: To compare the level of patient satisfaction with traditionally made and digitally made complete dentures.

Methodology: It was a prospective comparative study in one year and at the Department of Prosthodontics. Individuals who had entirely in use of edentulous ridges were recruited through non-probability consecutive sampling and were randomly assigned to two categories; the conventional complete dentures and the digitally made complete dentures. The SPSS version 26 was used in the analysis of data. T-tests and chi-square tests were used as an independent sample, and a p-value less than 0.05 was regarded as statistically significant.

Results: Patients who were rehabilitated using digitally manufactured complete dentures had a high level of satisfaction scores in all the areas of assessment when compared to those who received conventional dentures ($p < 0.05$).

Conclusion: Complete dentures that are digitally fabricated were also linked with high satisfaction levels in patients as opposed to conventional dentures. The findings endorse the clinical implementation of the digital denture workflow to improve patient-centered prosthodontics results

Keywords: *Full dentures; Computer-aided dentures; computer-assisted dentistry; patient satisfaction; prosthodontics; traditional denture fabrication*.

INTRODUCTION

Complete dentures have continued to be a foundation of prosthodontics and offer functional and cosmetic rehabilitation to edentulous patients.[1] The conventional, traditionalally made dentures take the form of several clinical and laboratory procedures, such as impression taking, jaw relation records, trial fittings, and hand arrangements of teeth.[2] Although effective, this method is time-consuming, technique-sensitive and has tendencies to variation in fit and patient comfort.

Emerging technologies in digital technology have transformed the field of dentistry in recent years with the introduction of computer-aided design and computer-aided manufacturing (CAD/CAM) to fabricate complete dentures.[3] Digital procedures have the potential to benefit, which include the accurate reproduction of anatomy, less chairside time, enhanced reproducibility, and simpler denture design adjustments.[4] A number of studies propose that there is a possibility that digitally manufactured dentures can improve patient comfort, adaptation and general satisfaction than the traditional approaches.[5-7]-

Patient satisfaction is an important parameter of the success of the prosthodontic, which includes retention, stability, aesthetics, mastication efficiency, speech, and general comfort.[8] Recent literature indicates that the conventional complete dentures gain between 65%-85% satisfaction levels, but the early experience with digitally produced dentures indicates that the satisfaction rates are slightly higher, and may reach up to 90% in some populations.[2, 9] Although these are encouraging results, systematic comparative studies are still necessary to assess the outcomes of patient-centered care in actual clinical practice.

The recent developments in digital denture creation, such as intraoral scanning, computer-aided design and additive or subtractive manufacturing, can be used to standardize clinical practice, decrease human error, and enhance the reproducibility of the prostheses.[10, 11] They are also easy to store and make changes, enabling electronic records of denture to be used in the future, making a new adjustment or replacement without undergoing the whole clinical procedure again.[4] Although these benefits are evident, the use of digital workflows in everyday clinical practice is still low, partly because of its cost and training needs and the general lack of awareness of its benefits.[12-14] Thus, it will be necessary to compare patient-centered outcomes with conventional and digitally fabricated dentures to give evidence-based advice to clinicians and inform patients on the possible functional and aesthetic benefits of digital prosthodontics.

The evidence-based clinical decision-making and optimization of the treatment regimens requires understanding the variation in patient satisfaction of conventional and digital dentures. The study will offer comparative information, which will guide clinicians in choosing the most appropriate denture fabrication method to suit the preferences and functional outcome of the patients. The objective of the research was to compare the satisfaction of the patients with the traditional and digitally printed complete dentures with regards to comfort, aesthetics, functionality, and overall acceptability.

METHODOLOGY

The study aimed to be a prospective comparative study in a span of one year form in the Department of Prosthodontics. The objective of the study was to compare and contrast patient satisfaction on use of traditional and digitally manufactured complete dentures.

The power and confidence level was taken to be 95% and 80% respectively and the calculated sample size was OpenEpi, which was based on an expected satisfaction rate of 30% on conventional dentures and 70% on digitally fabricated dentures.[5] The size of the sample that was calculated was 100 participants consisting of two different groups of 50 each.

Participants who were eligible to the inclusion criterion were recruited using a non-probability consecutive sampling method. The inclusion criteria were fully edentulous patients aged 45-80 years that had no prior denture experience, and were able to give informed consent. The exclusion criteria included patients whose systemic conditions would have impaired the oral tissues (i.e., uncontrolled diabetes), temporomandibular joint disorders, severe residual ridge resorption or adverse response to denture materials.

With the consent, the eligible participants were identified in the outpatient department of Prosthodontics throughout the research period. All participants signed the informed consent in writing before enrollment. An extensive clinical history was taken and an in-depth examination of the mouth was carried out with a view to proving that the patient was totally edentulous and that she was fit to get complete denture therapy as per the inclusion criteria.

The participants were randomly put in two groups- Group A had conventionally fabricated complete denture and Group B had digitally fabricated complete denture with a CAD/CAM workflow. All clinical activities such as primary and secondary impressions, jaw relation records, trial denture evaluation, and final denture delivery were done by the highly qualified prosthodontists ensuring standardization. In the case of the digital denture group, impressions and jaw relations were computerized and dentures were designed and manufactured using CAD/CAM technology as per the manufacturer requirements.

After denture insertion, the patients were provided with standardized instructions after insertion and planned to visit the dentist. In patient satisfaction, a pre-validated structured questionnaire was used to measure the patient satisfaction after four weeks of adaptation. The questionnaire measured various areas such as retention, stability, comfort, aesthetics, mastication, speech, and overall satisfaction on a five-point Likert scale of very dissatisfied to very satisfy.[15] The investigator noted all the responses to ensure that there is reduced reporting bias.

The Statistical package of social science, version 26, was used in entering, coding and analyzing data. The variables of age, length of edentulism, satisfaction scores were illustrated as mean and standard deviation and categorical variables as

frequencies and percentages. The independent sample t-test was used to compare the conventional and the digital denture groups, on the continuous variables, where the data distribution was checked to be normal. Chi-square test was used to evaluate the relationship between categorical variables. The p-value of 0.05 was taken to be statistically significant. Analytical rigor was maintained with all statistical tests being two tailed.

RESULTS

The research used 100 entirely edentulous patients, and half of them belonged to the conventional denture group and the other half to the digitally constructed denture group. The age of the participants was similar among the two groups and there was no statistically significant difference on the age, gender distribution, and duration of edentulism, which suggests that there was a baseline homogeneity of the study population (Table 1).

Table 1: Demographic Characteristics of Study Participants (n = 100)

Variable	Conventional Denture (n = 50)	Digital Denture (n = 50)	p-value
Age (years), Mean ± SD	64.2 ± 8.5	63.7 ± 7.9	0.74
Gender, n (%)			
Male	28 (56%)	27 (54%)	0.84
Female	22 (44%)	23 (46%)	
Duration of Edentulism (years), Mean ± SD	5.8 ± 3.2	6.1 ± 3.0	0.62

The digitally fabricated denture group had a significant mean score in patient satisfaction scores uniformly across all the measured domains. There was statistically significant difference in the parameters of retention, stability, comfort, aesthetics, mastication, speech and overall satisfaction whereby the digital denture group had better outcomes than the conventional denture group ($p < 0.05$) (Table 2).

Table 2: Comparison of Mean Patient Satisfaction Scores Between Groups

Satisfaction Parameter	Conventional Denture Mean ± SD	Digital Denture Mean ± SD	p-value
Retention	3.8 ± 0.9	4.4 ± 0.7	0.002*
Stability	3.6 ± 1.0	4.3 ± 0.6	0.001*
Comfort	3.7 ± 0.8	4.5 ± 0.5	<0.001*
Aesthetics	3.9 ± 0.9	4.6 ± 0.5	<0.001*
Mastication	3.5 ± 0.9	4.3 ± 0.6	0.001*
Speech	3.6 ± 0.8	4.4 ± 0.6	0.001*
Overall Satisfaction	3.7 ± 0.8	4.5 ± 0.5	<0.001*
(Measured using 5-point Likert scale: 1 = Very dissatisfied, 5 = Very satisfied) *Statistically significant at $p < 0.05$			

Satisfaction satisfaction levels were analyzed and the findings showed a higher percentage of patients documenting an increased satisfaction of the orally made denture as being very satisfied or satisfied than did not use the orally made denture but used the conventional dentures. On the other hand, the neutral and dissatisfied answers were more common among the conventional denture group and the members of the digital group did not report any dissatisfaction. This difference of the distribution of satisfaction was statistically significant (Table 3).

Table 3: Distribution of Satisfaction Levels Among Study Groups

Satisfaction Level	Conventional Denture n (%)	Digital Denture n (%)	p-value
Very Satisfied	10 (20%)	28 (56%)	<0.001*
Satisfied	22 (44%)	18 (36%)	
Neutral	12 (24%)	4 (8%)	
Dissatisfied	5 (10%)	0 (0%)	
Very Dissatisfied	1 (2%)	0 (0%)	

Additional comparison of functional and aesthetic satisfaction proved significantly higher satisfaction levels among the patients who were equipped with digitally produced dentures. The functional parameters, such as retention, stability, and mastication, the aesthetic and speech-related satisfaction, were significantly higher in digital denture than conventional group ($p < 0.05$) (Table 4).

Table 4: Comparison of Functional and Aesthetic Satisfaction Categories

Domain	Conventional Denture Satisfied/Very Satisfied n (%)	Digital Denture Satisfied/Very Satisfied n (%)	p-value
Functional Satisfaction (Retention, Stability, Mastication)	30 (60%)	45 (90%)	<0.001*
Aesthetic Satisfaction	32 (64%)	46 (92%)	<0.001*
Speech Satisfaction	31 (62%)	44 (88%)	0.002*

The general patient acceptance of digitally made complete dentures was also significantly more endorsed and most of the participants indicated high acceptance and none low levels. Conversely, moderate to low acceptance was recorded in a significant percentage of patients who used conventional dentures. The result highlights the increased perceived performance of the digitally printed dentures in patients (Table 5).

Table 5: Overall Patient Acceptance of Denture Type

Denture Type	High Acceptance n (%)	Moderate Acceptance n (%)	Low Acceptance n (%)
Conventional Denture	32 (64%)	13 (26%)	5 (10%)
Digital Denture	46 (92%)	4 (8%)	0 (0%)

DISCUSSION

The current research showed that patients who were rehabilitated by utilizing digitally manufactured complete denture reported much greater satisfaction in a variety of areas such as retention, stability, comfort, aesthetics, mastication, speech, and overall acceptance than the patients who used the conventional manufactured dentures. These results are consistent with an accumulating clinical data that endorses the incorporation of computerized processes in removable prosthodontics.

A recent pilot randomized crossover study found that digitally fabricated dentures had better ratings in terms of comfort and higher ratings in most of the domains of satisfaction than conventional dentures and most patients preferred the digital prosthesis upon trying both types. Digital approach had been noted as having the beneficial effects of comfort and lessening the adjustment requirements. This coincides with our findings of statistically significant comfort and functional outcome benefits of digital dentures.[5]

Nevertheless, not every study is consistent in its preference of digital workflows. In a systematic review and meta-analysis,

no major differences were detected between digital and conventional dentures regarding overall quality of life or most criteria of satisfaction, even though there were trends of slight benefits of digital methods in some areas, including stability. This implies that although digital dentures can improve particular functional results, they can be equally satisfied in other situations.[16, 17]

In line with these inconclusive results, studies that examined CAD/CAM 3D printed dentures specifically indicated that overall satisfaction of the patient did not differ between the printed and conventional dentures, whereas issues regarding aesthetics and phonetics were more evident with the digital group. This highlights the need to be careful about design and selection of material in the digital fabrication processes.[18] Previously randomized crossover studies have also shown that conventional dentures do not invariably lose to digital dentures in parameters such as phonetics, comfort and general satisfaction and digital technologies are not universal in some parameters and may require fabrication method (milled versus printed) and clinical guidelines.[19]

Outside satisfaction measures, a number of studies have reported clinical efficiency benefits of digital dentures such as reduction in chairside time and laboratory time and also cut in clinical costs, but which did not always translate into significant changes in patient satisfaction. It implies that online processes have logistical advantages that could contribute to increased satisfaction with the treatment experience despite the same level of satisfaction.[20] The concept that digital and standard dentures can provide similar clinical results in studies compared using standardized instruments has been strengthened by other clinical trials and comparative studies, though there have been digital workflow trends supporting increased fit, reduced post insertion adjustments, and increased patient convenience.

To conclude, although there is a certain variability in evidence base, due to the differences in study designs, digital fabrication techniques (milled vs. 3D printed), and measures of outcome, most recent studies indicate that digitally fabricated dentures have an opportunity to be equal to or exceed conventional dentures in the domain of key satisfaction, especially comfort and functional adaptation. The impact of our findings on this developing literature is that they show significant patient preferences toward digital dentures with statistically significant differences, which strengthens the importance of digital prosthodontic methods in enhancing edentulous patient outcomes.

Results of this work have significant implications in the modern day practice of prosthodontics. The markedly greater satisfaction of patients linked to digitally produced complete dentures indicates that digitally developed workflows may support the improvement of the patient-centered outcomes, in particular, in respect of the comfort, retention, appearance, and the overall acceptance. Due to its ability to incorporate the use of CAD/CAM technology, clinicians may be able to provide more predictable prostheses with a better fit and lower variability than the conventional methods. Also, fewer post-insertion adjustments and the decrease in the number of clinical visits that are typical of digital dentures might enhance clinical efficiency and patient convenience. These benefits contribute to the fact that digital denture fabrication should become part of the regular clinical practice, particularly in the case of patients who give more consideration to comfort, aesthetics, and quick healing.

There have been some limitations to this study in spite of its strengths. To begin with, the research was carried out within one center, which might not be sufficient to derive the results on other clinical units or populations. Second, patient satisfaction was measured at a relatively short period of follow-up; extended follow-ups can provide more information related to functional adaptation, wear and long-term satisfaction. Third, the subjective measurements like patient-reported satisfaction can be determined by the personal expectations and perceptions. Lastly, the cost-effectiveness analysis has not been mentioned which might be a significant aspect of the decision between traditional and digital denture manufacturing techniques in resource-restricted conditions.

CONCLUSION

The digitally produced complete dentures were shown to be much more satisfying to the patients than conventional complete dentures made with regard to various functional and aesthetic specifications. Digital dentures led to better rehabilitation of patients in terms of comfort, retention, mastication, speech, and overall acceptance. These results indicate that digital denture workflow has a potential to facilitate the results of the prosthodontic treatment and patient experience. With the ongoing changes in digital technologies, their combination into the entire denture fabrication could be a useful innovation in providing efficient, predictable, and patient-centered prosthodontic care. These results should be confirmed by further multicenter studies that have a longer follow-up period to investigate long-term clinical and economic advantages

REFERENCES

1. Bors, A., et al., From Conventional to Smart Prosthetics: Redefining Complete Denture Therapy Through Technology and Regenerative Science. Medicina, 2025. 61(6): p. 1104.

2. Mubaraki, M.Q., et al., Assessment of conventionally and digitally fabricated complete dentures: A comprehensive review. Materials, 2022. 15(11): p. 3868.

3. Alsawaf, A.F.B., Computer aided design/Computer aided manufacturing and 3D printing for fabrication of

complete dentures. 2023, University of Baghdad.

4. Freire, J.d.O.A., et al., Advances and challenges in the integration of digital technologies in complete dentures: a narrative literature review. Journal of Clinical and Experimental Dentistry, 2025. 17(5): p. e587.

5. Bors, A., et al., Patient Satisfaction and Perception with Digital Complete Dentures Compared to Conventional Complete Dentures—A Pilot Study. Dentistry Journal, 2025. 13(7): p. 291.

6. Tew, I.M., S.Y. Soo, and E.H.N. Pow, Digitally versus conventionally fabricated complete dentures: A systematic review on cost-efficiency analysis and patient-reported outcome measures (PROMs). The Journal of Prosthetic Dentistry, 2025. 133(4): p. 998-1007.

7. Zupancic Cepic, L., et al., Digital versus conventional dentures: a prospective, randomized cross-over study on clinical efficiency and patient satisfaction. Journal of clinical medicine, 2023. 12(2): p. 434.

8. Zubair, N., et al., Evaluation of patient satisfaction with fixed Prosthodontic therapy visiting Prosthodontic department of a Teaching Dental Hospital: Patient Satisfaction Towards Fixed Prosthodontic therapy. Pakistan Journal of Health Sciences, 2022: p. 212-215.

9. Chappuis Chocano, A.P., Performance of computer-assisted technology for manufacturing removable complete dentures and bars used in implant supported overdentures: systematics reviews. 2022, Universidade de São Paulo.

10. Liu, R., L. Zhao, and L. Xu, Research status, technical challenges, and clinical application of digitally fabricated complete dentures: A systematic review. The Journal of Prosthetic Dentistry, 2025.

11. CHEBIB, N., Digital scans for denture bearing areas: evidence of recent innovations.

12. Ferreira, J.C., et al. Empowering health professionals with digital skills to improve patient care and daily workflows. in Healthcare. 2025. MDPI.

13. Shujaat, S., et al., Integration of imaging modalities in digital dental workflows-possibilities, limitations, and potential future developments. Dentomaxillofacial Radiology, 2021. 50(7): p. 20210268.

14. Ohyama, H., et al., Challenges and Opportunities in Implementing Digital Technology in Dental Curriculum: A Review and Perspective. Cureus, 2025. 17(4).

15. Aletras, V., et al. Patient satisfaction measurement: A comparison of Likert and item-specific response options scales. in Healthcare. 2025. MDPI.

16. Fouda, A., et al., A systematic review on patient perceptions and clinician-reported outcomes when comparing digital and analog workflows for complete dentures. Journal of Prosthodontics, 2024.

17. de Camargo Poker, B., et al., Satisfaction and quality of life of patients rehabilitated with digital complete dentures: A systematic review and meta-analysis. The Journal of the American Dental Association, 2025.

18. Alotaibi, H.N. Patient Satisfaction with CAD/CAM 3D-Printed Complete Dentures: A Systematic Analysis of the Clinical Studies. in Healthcare. 2025. MDPI.

19. Ohara, K., et al., Patient satisfaction with conventional dentures vs. digital dentures fabricated using 3D-printing: A randomized crossover trial. Journal of Prosthodontic Research, 2022. 66(4): p. 623-629.

20. Casucci, A., et al., Digital vs. conventional removable complete dentures: A retrospective study on clinical effectiveness and cost-efficiency in edentulous patients: Clinical effectiveness and cost-efficiency analysis of digital dentures. Journal of Dentistry, 2025. 153: p. 105505.