ACCEPTED MANUSCRIPT

Accepted manuscripts are the articles in press that have been peer reviewed and accepted for publication by the Editorial Board of the Vojnosanitetski Pregled. They have not yet been copy edited and/or formatted in the publication house style, and the text could still be changed before final publication.

Although accepted manuscripts do not yet have all bibliographic details available, they can already be cited using the year of online publication and the DOI, as follows: article title, the author(s), publication (year), the DOI.

Please cite this article COMPLETE DENTURE PARAMETERS REFLECTING THE SATISFACTION OF DENTISTS AND PATIENTS

Authors Dr. Abdul Razzaq Ahmed1, Dr. Saurabh Chaturvedi 2, Dr. Gotam Das3, Dr. Muhammad Farhan Khan4, Ghazala Suleman5, Muhammad Sibghatullah6, Vojnosanitetski pregled (2020); Online First March, 2020.

UDC:

DOI: https://doi.org/10.2298/VSP191111030A

When the final article is assigned to volumes/issues of the Journal, the Article in Press version will be removed and the final version appear in the associated published volumes/issues of the Journal. The date the article was made available online first will be carried over.
COMPLETE DENTURE PARAMETERS REFLECTING THE SATISFACTION OF DENTISTS AND PATIENTS

Dr. Abdul Razzaq Ahmed¹, Dr. Saurabh Chaturvedi ², Dr. Gotam Das³, Dr. Muhammad Farhan Khan⁴, Ghazala Suleman⁵, Muhammad Sibghatullah⁶

1. Dr. Abdul Razzaq Ahmed FCPS
2. Dr. Saurabh Chaturvedi MDS, PhD
3. Dr. Gotam Das FCPS
4. Dr. Muhammad Farhan Khan FCPS
5. Dr. Ghazala Suleman FCPS
6. Dr. Muhammad Sibghatullah MSc

1,2,3,4 and 5. Assistant Professor, Department of Prosthodontics, College of Dentistry, King Khalid University, Abha, Kingdom of Saudi Arabia.
6- Assistant Professor Department of Restorative Dentistry. College of Dentistry, King Khalid University, Abha Kingdom of Saudi Arabia.

Email: reals11@hotmail.com.

Correspondence
Dr. Gotam Das
Assistant Professor Prosthodontics
College of Dentistry, King Khalid University, Abha, Kingdom of Saudi Arabia.
Email: drgotam2000@gmail.com
Cell No. +966593280973
Abstract

Background/aim: Patients’ expectations with regards to their complete dentures are usually high. It is quite challenging to meet a patient’s criteria of denture satisfaction. With older age, patients expect even higher satisfaction levels, making it very difficult to convince them to adapt to their artificial dentures. It is still debatable to comprehend the patient’s dissatisfaction levels despite complete diagnosis and treatment planning before the provision of complete dentures. Moreover, it also becomes a challenging task when the patient’s expectation exceeds the patient’s satisfaction regardless of denture quality. The aim of this study was to determine the difference in the denture satisfaction levels between the dentist and complete denture wearers.

Materials and method: There were 134 completely edentulous participants, aged between 48 and 65 years. Data were recorded through a validated questionnaire having a Cronbach α validity of 85%. Sociodemographic data, patient’s priority, dentist satisfaction, and patient satisfaction with the dentures were recorded and rated on a Likert scale (1 to 5). Spearman’s correlation was applied to measure similarity between the dentist and patient satisfaction score.

Results: The correlation between occlusion and the patient’s comfort was moderately strong (p<0.05). The correlations between quality of denture, extension, and patient’s aesthetics, mastication, phonetics, and comfort were weakly positive (p<0.05). A weakly positive correlation was also found between denture extension and patient’s aesthetic, mastication, and phonetics (p<0.05). A very weak positive correlation was found between occlusion and patient’s aesthetics (p<0.05), whereas weak positive correlations were found between occlusion and the patient’s mastication and phonetics.

Conclusion: A positive correlation existed between the quality of the denture, vertical relation, and occlusion with the patient’s aesthetics, mastication, phonetics, and comfort. A positive association existed between the older-age patients and the dentist and patient satisfaction.

Keywords: Complete denture; patient satisfaction; dentist satisfaction
Introduction

Edentulism affects oral health in a diverse manner. However, phonetics, mastication, comfort, and aesthetics are major constraints disturbing the quality of life (1). Al Hamdan et al. reported around 82% of edentulism in Riyadh, Saudi Arabia (2). It is highly challenging to meet patient’s criteria of denture satisfaction. With older age, the satisfaction level becomes very high, making it difficult to convince the patient to adapt to their artificial dentures (3). Different parameters affecting a patient’s satisfaction with a new complete denture and satisfaction of the dentist have been investigated (4).

It has been evident that implant-supported overdentures gain higher satisfaction compared to complete dentures (5). However, most patients prefer complete dentures over the costly prosthesis. It is also noted that satisfaction levels are highly associated with age and physiological and neurological factors greatly impact patient’s satisfaction (6). When patients present with resorbed ridges, it becomes difficult to provide retention in a denture and hence patient and dentist satisfaction are compromised (7). Moreover, saliva and other systemic conditions also play an important role (8). Bilhan et al. concluded that 85% of patients lack denture retention, whereas the highest mean satisfaction score for speech was $77.27 \pm 29.04$ (9).

It becomes a challenging task when the patient’s expectation exceeds the patient’s satisfaction regardless of the denture quality. Hence, the dissatisfied patient reflects the failure of the treatment plan (10). Smith (11) and Berg (12) also revealed that prediction of patient satisfaction does not correlate with the quality of the denture. In a Brazilian study, most patients complained about phonetics and mastication being very challenging to them post-edentulism.

It is therefore very important to establish open communication with the patient and patient’s expectations regarding dentures. Having one-to-one interaction with patients and highlighting all the possible outcomes for denture fabrication will help patient’s expectations become more realistic and practical, reflecting a positive impact on their overall satisfaction (13). Another study conducted in 2003 in Croatia, measured using Spearman’s rank correlation, ascertained the strongest correlation between dentist’s satisfaction and patient’s satisfaction, as well as with retention of complete dentures (14).

Literature has revealed that the success of the treatment is a reflection of the patient’s satisfaction and should be evaluated by the patient himself. The chief purpose to
accomplish successful treatment is to prioritize and fulfil the patient’s demands. However, the assessment criteria lack patients’ need and priority and are attributed to existing criteria (15). Unfortunately, due to the paucity of local data, most studies have found out the association between patient satisfaction and complete denture therapy with different factors influencing satisfaction levels. Nevertheless, this study has attempted to prioritize patients’ needs in terms of four important parameters that are likely required and to discover the correlation between patient’s and dentist satisfaction levels. The research was devised to reveal factors that likely enhance patient satisfaction through dentist satisfaction in order to draw a paradigm of satisfaction parameters that could be incorporated in future denture fabrications.

**Materials and methods**
The present study was a cross-sectional study conducted in the department of prosthodontics at King Khalid University from the period of 2016 to 2018. Patients were enlisted through a non-probability consecutive sampling technique. The sample size was estimated using a sample size calculator for correlation between the quality of the mandibular denture-bearing area and retention as -0.301 (14), power of test as 80% and 99% confidence level. The estimated sample size was 134. After inflating the sample size by 8% for lost to follow-up, we included 134 participants in the present study. Ethical approval and implied consent were obtained. Edentulous patients aged between 48 and 65 years of either gender participated in the study. The patients had their blood pressure under control and diabetic patients were included in the study with no other systemic disease, and patients who were mentally incapacitated were excluded from the study.

Data were collected through a validated questionnaire having a Cronbach α validity of 85%, which were divided into sociodemographic, patient’s priority, dentist satisfaction through denture assessment, and patient satisfaction. Dentist and patient satisfaction were rated on a Likert scale (1 to 5), with 5 = very satisfied, 4 = satisfied, 3 = neither satisfied nor dissatisfied, 2 = dis-satisfied, and 1 = very dissatisfied.

SPSS version 23 was used to analyze the data. Mean and SD were calculated for quantitative variables, whereas frequencies and percentages were calculated for qualitative variables. Spearman’s correlation was applied to assess the strength of the relationship between dentist and patient satisfaction scores. Furthermore, stratification with respect to
effect modifiers such as age, gender, employment, and educational status was done. Post-stratification Spearman’s correlation was applied to assess the strength of the relationship between dentist and patient satisfaction score. P<0.05 was taken as statistically significant.

Results
There were 134 participants included in the study. The average age was 58.75 years; most patients were males (56.7%), whereas 43.3% were females. About 98 participants were unemployed and 8 participants were uneducated. According to patient’s priority, most of them preferred mastication, followed by aesthetics, phonetics, and comfort prior to fabrication of dentures (Table 1). The mean dentist’s and patient’s overall satisfaction scores were calculated as 3.58±0.74 and 3.538±0.521, respectively. Weak positive correlations were found between quality of denture, extension, and patient’s aesthetic, mastication, phonetics, and comfort (p<0.05). A weak positive correlation was found between extension and patient’s aesthetic, mastication, and phonetics (p<0.05), whereas no meaningful correlation was found between extension and patient’s comfort (Table 2). A weak positive correlation was found between vertical relation and patient’s aesthetic, mastication, and comfort, whereas no meaningful correlation was found between vertical relation and patient’s phonetics. A very weak positive correlation was found between occlusion and patient’s aesthetic (p<0.05), whereas weak positive correlations were found between occlusion and patient’s mastication and phonetics. The correlation between occlusion and the patient’s comfort was moderately strong (Table 2).

With respect to age, participants ≥60 years of age showed a high value of correlation between the dentist and patient satisfaction as compared to participants younger than 60 years. With respect to gender, females showed a high value of correlation between dentist and patient satisfaction as compared to males. With respect to employment status, employed participants showed a strong correlation between dentist and patient satisfaction as compared to unemployed patients. Lastly, educated participants showed a positive moderate correlation between dentist and patient satisfaction, whereas uneducated participants showed a meaningless and insignificant relationship (Table 3).
### TABLE 1: BASELINE FEATURES OF PARTICIPANTS (n=134)

| Qualitative variable | n   | %   |
|----------------------|-----|-----|
| Gender               |     |     |
| Male                 | 76  | 56.7|
| Female               | 58  | 43.3|
| Employment status    |     |     |
| Employed             | 36  | 26.9|
| Unemployed           | 98  | 73.1|
| Educational status   |     |     |
| Educated             | 126 | 94.0|
| Uneducated           | 8   | 6.0 |
| Patient priority     |     |     |
| Aesthetic            | 40  | 29.9|
| Mastication          | 62  | 46.3|
| Phonetics            | 18  | 13.4|
| Comfort              | 14  | 10.4|

| Quantitative variable | Mean | SD  |
|-----------------------|------|-----|
| Age (years)           | 58.57| 7.25|

### TABLE 2: ANALYSIS OF DENTIST AND PATIENT SATISFACTION

#### CORRELATION BETWEEN DENTIST AND PATIENT SATISFACTION PARAMETERS

| DENTIST SATISFACTION PARAMETERS | Correlation and P-value | PATIENT SATISFACTION PARAMETERS | Aesthetic | Mastication | Phonetics | Comfort |
|---------------------------------|-------------------------|---------------------------------|-----------|-------------|-----------|---------|
| Quality of denture              | r 0.223<sup>·</sup> 0.245<sup>·</sup> 0.368<sup>·</sup> 0.205<sup>·</sup> |                                |           |             |           |         |
|                                 | P-value 0.010 0.004 0.000 0.018 |                                |           |             |           |         |
| Extension                       | r 0.268<sup>·</sup> 0.218<sup>·</sup> 0.301<sup>·</sup> 0.155 |                                |           |             |           |         |
|                                 | P-value 0.002 0.011 0.001 0.074 |                                |           |             |           |         |
| Vertical relation               | r 0.277<sup>·</sup> 0.355<sup>·</sup> 0.056 0.260<sup>·</sup> |                                |           |             |           |         |
|                                 | P-value 0.001 0.001 0.521 0.002 |                                |           |             |           |         |
| Occlusion                       | r 0.171<sup>·</sup> 0.353<sup>·</sup> 0.269<sup>·</sup> 0.444<sup>·</sup> |                                |           |             |           |         |
TABLE 3: STRATIFICATION WITH RESPECT TO AGE, GENDER, EMPLOYMENT AND EDUCATIONAL STATUS

| VARIABLES                | CORRELATION BETWEEN DENTIST AND PATIENT SATISFACTION OVERALL SCORE | P-value |
|--------------------------|---------------------------------------------------------------------|---------|
| Age group                |                                                                     |         |
| <60 years (n=89)         | 0.553**                                                             | 0.001   |
| ≥60 years (n=45)         | 0.577**                                                             | 0.001   |
| Gender                   |                                                                     |         |
| Male (n=76)              | 0.551**                                                             | 0.001   |
| Female (n=58)            | 0.586**                                                             | 0.001   |
| Employment status        |                                                                     |         |
| Unemployed (n=98)        | 0.563**                                                             | 0.001   |
| Employed (n=36)          | 0.635**                                                             | 0.001   |
| Educational status       |                                                                     |         |
| Uneducated (n=8)         | 0.115                                                               | 0.393   |
| Educated (n=126)         | 0.581**                                                             | 0.001   |

Discussion

According to the present study, Spearman’s correlation was applied between the dentist and patient satisfaction parameters. The patients in this study preferred chewing as the main reason to visit the dentist for complete denture treatment, as old patients are likely to consider that treatment is required if they experience difficulty in chewing, or a social embarrassment, which is also validated by de Souza FI et al. and Kossioni A et al. (16,17).
A study evaluated problems faced by patients post denture insertion. The most common complaint was inability to chew appropriately, and when the denture was examined, it was short of retention, which is a possible cause for dissatisfaction for both dentist and patients (9). Hence, the present study showed that, nevertheless, a weak but positive correlation existed between the quality and extension of the denture and patient’s aesthetic, mastication, and phonetics (p<0.05).

Yoshida et al. evaluated the correlation between satisfaction with daily life and complete denture. The study showed that patients who were satisfied with their life were also satisfied with their complete dentures, which showed a strong positive correlation and P-value<0.05 (18). This can be explained in terms of social and cultural factors, which had a great impact on denture satisfaction; a stress-free life led to higher denture satisfaction scores. In a study by Sato Y et al., a multivariate regression analysis and chi-square test were used to assess the relation between denture satisfaction and contributing factors (19). The study showed significant results and the findings were in complete agreement with the results of the present study – showing a strong association between satisfaction and retention of upper dentures, followed by a positive correlation with speech and tasting.

The results of the present study also concur with Epifania E et al.’s study. They studied the quality of completed denture and satisfaction of patients and concluded that there was a strong relationship between the quality of denture and patient satisfaction. In detail, adequate extension and retention of the denture was associated with satisfaction (20). Other researchers also found a positive correlation between the denture quality and patient satisfaction (21,22,23). Conversely, Anastassiadou V et al. have found a weak relation between denture quality and patient satisfaction (24). Furthermore, the studies carried out by Erić J et al. and Fenlon MR et al. found absolutely no relation between the denture quality and patient satisfaction (25,26).

In the present study, with respect to gender, females displayed a high value of association between dentist and patient satisfaction as compared to males. Similarly, females were more likely to be satisfied with their aesthetics; however, females were less satisfied with mastication, which might be due to their need to seek treatment solely for aesthetic purposes (27-30). In another study, the results showed that most patients were satisfied with their aesthetics and there was no difference between men and women; however, that
study also assessed expectation levels and found that men had more expectations with their dentures as compared to females (3). Within the limitation of this study, we recommend evaluating more in-depth contributing factors and their correlation regarding patient and dentist satisfactions. Furthermore, a large sample size for future studies would also help to obtain more accurate results.

Conclusion
Generally, patients were satisfied with the quality of their complete dentures. Positive correlations existed between denture quality, vertical relation, and occlusion and patient’s aesthetics, mastication, phonetics, and comfort. A positive association existed between old-age patients and dentist and patient satisfaction. Thus, improving dentist-patient communication is the most useful strategy to improve patients’ satisfaction with their dentures.

REFERENCES
1. Felton DA. Edentulism and comorbid factors. J Prosthodont 2009; 18(2):88-96.
2. Al Hamdan E, Fahmy MM. Socioeconomic factors and complete edentulism for female patients at King Saud University, Riyadh, Saudi Arabia. TDJ 2014; 11(3):169-73.
3. McCunniff M, Liu W, Dawson D, Marchini L. Patients’ esthetic expectations and satisfaction with complete dentures. J Prosthet Dent 2017; 118(2):159-65.
4. Marchini L. Patients’ satisfaction with complete dentures: an update. Braz Dent Sci 2014; 17(4): 5-16.
5. Gjengedal H, Berg E, Gronningsaeter AG, Dahl L, Malde MK, Boe OE, Trovik TA. The influence of relining or implant retaining existing mandibular dentures on health-related quality of life: a 2-year randomized study of dissatisfied edentulous patients. Int J Prosthodont 2013; 26(1): 68-78.
6. Hantash RO, AL-Omiri MK, Yunis MA, Dar-Odeh N, Lynch E. Relationship between impacts of complete denture treatment on daily living, satisfaction and personality profiles. J Contemp Dent Pract 2011; 12(3):200-7.
7. Yamaga E, Sato Y, Minakuchi S. A structural equation model relating oral condition, denture quality, chewing ability, satisfaction, and oral health-related quality of life in complete denture wearers. J Dent 2013; 41(8):710-7.
8. Musa I, Knezović-Zlatarić D, Čelebić A, Bošnjak A. The influence of gender and age on the values of linear radiomorphometric indices measured on the lower border of the mandible. Acta Stomatol Croat 2002; 36(2):199-202.

9. Bilhan H, Geckili O, Ergin S, Erdogan O, Ates G. Evaluation of satisfaction and complications in patients with existing complete dentures. J Oral Sci 2013; 55(1):29-37.

10. Marachlioglou CR, Dos Santos JF, Cunha VP, Marchini L. Expectations and final evaluation of complete dentures by patients, dentist and dental technician. J Oral Rehabil 2010; 37(7):518-24.

11. Smith M. Measurement of personality traits and their relation to patient satisfaction with complete dentures. J Prosthet Dent 1976; 35(5):492-503.

12. Berg E. The influence of some anamnestic, demographic, and clinical variables on patient acceptance of new complete dentures. Acta Odontol Scand 1984; 42(2):119-27.

13. Silva JCM, Santos JFF, Marchini L. Factors influencing patients’ satisfaction with complete dentures: a qualitative study. Braz Dent Sci 2014; 17:83-8.

14. Čelebić A, Knezović-Zlatarić D, Papić M, Carek V, Baučić I, Stipetić J. Factors related to patient satisfaction with complete denture therapy. J Gerontol A Biol Sci MedSci 2003; 58(10):M948-53.

15. Hlatky MA. Patient preferences and clinical guidelines. JAMA 1995; 273(15):1219-20.

16. de Souza FI, de Souza Costa A, Dos Santos Pereira R, Dos Santos PH, de Brito RB Jr, Rocha EP. Assessment of satisfaction level of edentulous patients rehabilitated with implant-supported prostheses. Int J Oral Maxillofac Implants 2016;31(4): 884-90.

17. Kossioni A, Bellou O. The effect of aging and dental status on the frequency of eating out. Arch Gerontol Geriatr 2012; 54(2):e130-3.

18. Yoshida M, Sato Y, Akagawa Y, Hiasa K. Correlation between quality of life and denture satisfaction in elderly complete denture wearers. Int J Prosthodont 2001; 14(1):77-80.

19. Sato Y, Hamada S, Akagawa Y, Tsuga K. A method for quantifying overall satisfaction of complete denture patients. J Oral Rehabil 2000; 27(11):952-7.

20. Epifania E, Sanzullo R, Sorrentino R, Ausiello P. Evaluation of satisfaction perceived by prosthetic patients compared to clinical and technical variables. J Int Soc Prev Community Dent 2018; 8(3):252-58.
21. Tórres ACSP, Maciel AQ, de Farias DB, de Medeiros AKB, Vieira FPTV, Carreiro ADFP. Technical quality of complete dentures: Influence on masticatory efficiency and quality of life. J Prosthodont 2019; 28(1):e21-6.
22. Alfadda SA. The relationship between various parameters of complete denture quality and patients’ satisfaction. J Am Dent Assoc 2014; 145(9):941-8.
23. Cerutti-Kopplin D, Emami E, Hilgert JB, Hugo FN, Rivaldo E, Padilha DMP. Predictors of Satisfaction with Dentures in a Cohort of Individuals Wearing Old Dentures: Functional Quality or Patient-Reported Measures? J Prosthodont 2017; 26(3):196-200.
24. Anastassiadou V, Robin Heath M. The effect of denture quality attributes on satisfaction and eating difficulties. Gerodontology 2006; 23(1):23-32.
25. Errić J, Tihačeš Šojić L, Bjelović L, Tsakos G. Changes in Oral Health Related Quality of Life (OHRQoL) and Satisfaction with Conventional Complete Dentures Among Elderly People. Oral Health Prev Dent 2017; 15(3): 237-244.
26. Fenlon MR, Sherriff M. Investigation of new complete denture quality and patients' satisfaction with and use of dentures after two years. J Dent 2004; 32(4):327-33.
27. Pan S, Awad M, Thomason JM, Dufresne E, Kobayashi T, Kimoto S, Wollin SD, Feine JS. Sex differences in denture satisfaction. J Dent 2008; 36(5):301-8.
28. Awad MA, Feine JS. Measuring patient satisfaction with mandibular prostheses. Community Dent Oral Epidemiol 1998; 26(6):400-5.
29. Ishikawa M, Sato Y, Kitagawa N, et al. Effectiveness of a clinical pathway for complete denture adjustment. J Oral Sci 2019; 61(4):483–90.
30. Carletti TM, Pinheiro MA, Meira IA, Amaral CF, Rodrigues Garcia RCM. Prostheses satisfaction and diet of elderly wearing a single implant overdenture: A six-month assessment. Spec Care Dentist 2019; 39(5):471–7.

Received on November 11, 2019.
Revised on March 12, 2020.
Accepted on March 13, 2020.
Online First March, 2020.