Title: The Patient’s Denture Assessment (Thai version) is a valid and reliable tool for evaluating complete denture treatment and success

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Abstract

BACKGROUND. Complete tooth losses are still being major problems which resulted in lesser quality of life especially for elderly patients. However, there are still lack of questionnaire to evaluate the treatment outcome from the patient’s aspect. The objective of this study is to evaluate the reliability and validity of the Patient’s Denture Assessment-Thai version (PDA-T), then use this questionnaire to assess patient satisfaction with complete denture treatment.

METHODS. The subjects comprised 120 edentulous adult patients (49 men/71 women; average age 70 years-old) from the Prosthodontic and the Geriatric Dentistry and Special Patients Care Clinic at the Faculty of Dentistry, Chulalongkorn University during 2019 March–2020 March. The patients were divided into two groups: The group experienced (Exper) (n=54) with wearing complete dentures, and the non-experienced (NonExper) group (n=66). The patients used the validated PDA-T to self-assess their treatment at different times. The Exper group completed the questionnaire at t₀ (during treatment), t₀.5 (2–8-weeks after t₀), and t₁ (final follow-up). The NonExper group completed the questionnaire only at t₁.
RESULTS. In the Exper group, Cronbach’s α and average inter-item correlation was 0.95 (range 0.76–0.95) and 0.47 (range 0.57–0.83), respectively. The intraclass correlation coefficients (n = 18, 95% confidence interval) were 0.98 overall. The paired t-test (p < 0.05) between t₀ and t₁ indicated a significant difference between t₀ and t₁ in every PDA-T topic, and the effect size was 1.71. In the NonExper group, the Pearson correlation analysis indicated no significant correlation between the patients' demographics and masticatory function.

CONCLUSIONS. The reliability and validity of the PDA-T indicate it is a valuable tool for evaluating complete denture treatment. Treatment success affected the patients' satisfaction, but was not associated with the patients’ prior denture experience, sex, or educational level.

**Word count:** 286 words.

**Keyword:** PDA-T, Complete denture, Reliability and validity, self-assessment, satisfaction

**Background**

Although oral health prevention and promotion methods have improved, tooth loss remains a problem at the national level in some countries.(1) According to the 8th National Oral health survey in Thailand, the amount of tooth loss remains high and results in major oral problems. There are many studies on the relationship between tooth loss and oral health related quality of life, specifically in aging people.(2, 3) Moreover, many surveys have(4-7) demonstrated a significant decline in Quality of Life (QoL) when people lose teeth and when denture wearers cannot adapt to their new prosthesis. A study using the Oral Impacts on Daily Performance Index (OIDP) found increased problems from tooth loss and a significantly decreased QoL for the five distal teeth.(8) The prosthesis for an edentulous ridge can be a partial or total denture that restores function and appearance.(9) For edentulous patients, conventional complete denture treatment remains the treatment of choice compared with an implant-retained denture.
Many previous studies have used General Oral Health Assessment Index (GOHAI)\textsuperscript{10}, \textsuperscript{11}, Oral Health Impact Profile (OHIP)\textsuperscript{12}, or Oral Impacts on Daily Performance Index (OIDP)\textsuperscript{13}, to interpret patients’ Oral Health related Quality of Life (OHRQoL).\textsuperscript{14, 15} However, The Patient’s Denture Assessment (PDA),\textsuperscript{9} determines QoL based on aspects of wearing a complete denture. The optimum denture treatment outcome requires a careful, systematic evaluation of the existing tissue and oral conditions to accurately fabricate the denture. At every clinical step, dentists and patients (including the patients’ family) share their opinions and evaluate the step results, such as tooth color selection, tooth arrangement try-in or the clinical remount for the occlusion. Furthermore, when using the denture, reevaluation and recall after a period of denture use is needed. However, the success of prosthodontic treatment can be evaluated differently by dentists or patients. Therefore, at the final follow-up, the patient’s evaluation of their denture should considered by the dentist. A patient-centered evaluation is an important part of successful denture treatment. Patient satisfaction is usually determined by various factors, including pain, well-fitting, esthetics, retention, stabilization, sense of comfort, and the denture’s chewing ability.\textsuperscript{9} A valid and reliable multidimensional self-assessment tool to evaluate patients’ satisfaction and a clinical examination of the denture is needed, so that the dentist can identify the patient-based factors affecting treatment success.

The PDA is an instrument for patient self-assessment. This questionnaire was originally developed in Japanese for edentulous patients with complete dentures at the Tokyo Medical and Dental University, Japan.\textsuperscript{16} The PDA allows the patient to self-assess their satisfaction with their complete dentures based on perceptions and feelings.\textsuperscript{9, 16} The PDA is used for making a diagnosis, determining the prognosis, and comparing the efficacy of the complete denture (before and after treatment).\textsuperscript{9} Some questionnaires that use many different factors to evaluate the treatment result and measure quality of life have not had their
reliability and validity determined, however, some methods included several questions concerning the multidimensional evaluation of patient satisfaction.\textsuperscript{(17-20)}

The PDA Thai version (PDA-T) was developed using the WHO cross-cultural process. After psychometric (face validity and content validity) testing, an additional question was added to the PDA-T for a total of 23 questions.\textsuperscript{(21)} The purpose of this study was to evaluate the reliability and the validity of the PDA-T, and then use this self-assessment form to evaluate Thai patients’ satisfaction concerning their complete denture experience.

**Methods**

The patients in this cross-sectional study were randomly selected from the undergraduate Clinic, postgraduate Prosthodontic Clinic, or postgraduate Geriatric and Special Care Clinic, Dental Hospital, Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand during 2019 March–2020 March. The participants were edentulous patients who had received a complete denture two or more times, or had no history of wearing a complete denture (CD). The patients’ had already begun their denture treatment. There were 120 patients (49 men, 71 women) in this study. The inclusion criteria were that the participants could read and respond in Thai, and were without any signs of dementia or any mental disabilities. While the exclusion criteria were that the patient can not respond consciously or understandably and were not involved as a faculty’s patients. The study protocol was approved by the Human Research Ethics Committee at the Faculty of Dentistry, Chulalongkorn University (HREC-DCU 2019-004). Consent forms were signed prior to enrollment to the study.

The patients’ demographic information and chief complaint were collected. Of the 110 patients, 54 patients had received complete dentures at least once before and were placed in the Experienced (Exper) group. In this group, the participants completed the questionnaire two times: during treatment ($t_0$), and after the final treatment follow-up ($t_1$). The remaining 66
patients who had never worn complete dentures before were assigned to the non-experienced (NonExper) group. From G*Power calculation, suggested that at least 46 patients were necessary to find a significant effect: effect size at 0.50, α<0.50, and 95% power. This group had their data collected only once at the final follow-up (t₁). The data were collected and evaluated by one investigator. Each of the questionnaires’ 6 topics had their own subtopics, comprising groups of items in that particular topic.²¹

The patients’ satisfaction with their complete denture was measured using the PDA-T. The patients were requested to mark their answer on the visual analog scale (VAS), where the right-end was the most positive (100), and the left-end was the most negative (0). Eighteen patients were randomly selected from the Exper group to determine test-retest reliability. This was done at any treatment step prior to the final follow-up (t₀), and the PDA-T was repeated 2 weeks or more within 8 weeks (t₀.⁵). The diagram for the trial method is presented in Figure 1. Students treated the patients supervised by clinical faculty from the first visit to denture delivery to case completion. Thus, the treatment steps were standardized between cases.

Figure 1 Study flow schematic.

Exper group: Internal reliability was determined using the Cronbach alpha coefficient and the average relationship inter-item correlation tests. The ideal range of the average inter-item correlation is 0.15–0.50; however, to be clinically useful, the range should be between 0.30–
0.80. External reliability or reproducibility shows the degree of agreement between measurements taken at different times. The external reliability in this study, using the test-retest reliability index, was assessed by determining the intraclass correlation coefficient (ICC) and 95% confidence interval of the test-retest difference for 18 patients. The significant range of clinically acceptable agreement $\geq 0.75$. Discriminant validity means the index can accurately distinguish the characteristics measured by other indicators with different theoretical structures. To compare the PDA-T scores between $t_0$–$t_1$ in the Exper group, the score was calculated by summing the VAS scores of the question items corresponding to each subtopic. We assessed the differences in PDA-T scores between $t_0$ and $t_1$ using the paired t-test. Furthermore, the summary score of all the question items was divided by the best possible score (2300 based on 23 question with 100 the best score per question). An increased value at $t_1$ compared with $t_0$ indicated a better score.

The effect size compares the efficacy of different treatments by quantifying the size of the difference between treatments. The effect size in the Exper group was determined using Cohen’s $d$. Cohen’s $d$ was calculated from two mean values and their standard deviation (SD) within the same amounts of samples $[d = (\text{mean of } t_1\text{-PDA-T} - \text{mean of } t_0\text{-PDA-T})/\text{Pooled SD}].$ Cohen’s $d$ classifies effect sizes as small ($d = 0.2$), medium ($d = 0.5$), large ($d = 0.8$), and very large ($d \geq 1.3$).

**NonExper group:** The concurrent validity between the undergraduate and postgraduate clinics was tested by Pearson’s correlation, using the linear relationship criteria for the result ($r^+: \text{direct linear relationship, } r^-: \text{inverse linear relationship, } r^0: \text{non-linear relationship}$) with a significance level of 5%. We examined the association between the patient’s demographics and PDA-T scores.
Statistical analysis

G-Power version 3.1 software (Erdfelder et al., 1996) was used for NonExper’s sample size analyses.

SPSS version 20.0 (SPSS Bangkok, Thailand) was used for all statistical analyses.

**Exper group:** The internal consistency of the PDA-T was assessed using Cronbach’s α and average inter-item correlation. The test-retest reliability was assessed with the ICCs with a 95% confidence interval in 18 random patients (t₀, t₀.₅). The discriminant validity was assessed between PDA scores using the paired t-test before and after treatment. Values of p < 0.05 were considered significant for the paired t-test. The ability to detect change was determined based on effect size using Cohen’s d criteria.

**NonExper group:** Concurrent validity was determined using Pearson correlation at a significance level of 5%.

**Results**

The demographics of the patients (49 men, 71 women; average age 70 years) are presented in Table 1. We determined the mean and SD in each topic of the T₀ and T₁ PDA-T

| Characteristics                                      | Group          | Exper(n=54) | NonExper(n=66) |
|------------------------------------------------------|----------------|-------------|----------------|
|                                                      | N  | %      | N   | %       |
| Period of edentulousness                             |    |        |     |         |
| <1 year                                              | 0  | 0      | 60  | 90.9    |
| 1 year ≤ 5 years                                     | 10 | 18.5   | 6   | 9.1     |
| 5 years ≤ 10 years                                   | 22 | 40.7   | 0   | 0       |
| ≥10 years                                            | 22 | 40.7   | 0   | 0       |
| Number of previous complete dentures, piece(s)       |    |        |     |         |
| never                                                | N/A|        | 66  | 100     |
| 1–3                                                  | 45 | 83.3   | N/A | N/A     |
| 4–6                                                  | 9  | 16.6   | N/A | N/A     |
| Denture problems for requiring a new one             |    |        |     |         |
| Ill-fitting complete dentures                        | 35 | 64.8   | N/A | N/A     |
| Malfunction while chewing                            | 18 | 33.3   | 61  | 92.4    |
| Broken/lost previous complete denture                | 28 | 51.9   | N/A | N/A     |
| Esthetic concern                                     | 2  | 3.7    | 12  | 18.2    |
| Extracted natural teeth                              | N/A|        | 66  | 100     |
| Responsible treatment clinic                         |    |        |     |         |
| Undergraduate                                        | 29 | 53.7   | 30  | 45.5    |
| Postgraduate                                         | 25 | 46.3   | 36  | 54.5    |
| Highest educational level                            |    |        |     |         |
| Non-educated                                         | 9  | 16.7   | 8   | 12.1    |
| Primary-secondary school                             | 34 | 63.0   | 42  | 63.7    |
| Diplomas                                             | 5  | 9.3    | 4   | 6.1     |
| Bachelor’s degree                                    | 5  | 9.3    | 9   | 13.6    |
| Master’s degree                                      | 1  | 1.9    | 3   | 4.5     |

*Table 1. The denture wearing history of the participants (N = 120).*
(Table 2). These results revealed a significant increase from $T_0$ to $T_1$ in all subtopics in the Exper group. However, the Lower denture topic questions had the lowest score compared with the other topics at both evaluation time points, while the least difference in scores between topics was in the Beauty and speech and Importance topics, as well as in Q13 and Q15 in the Expectation topic. At $t_1$ in the NonExper group, there were no significant differences between subtopic scores. However, the Lower denture topic had the lowest score (under 90) in every subtopic.

| Topics            | Subtopics       | Mean ± SD | $t_0$ (n=54) | $t_1$ (n=54) | $t_1$ (n=66) |
|-------------------|-----------------|-----------|--------------|--------------|--------------|
| Function          | Q1              | 68 ± 34   | 95 ± 10      | 97 ± 12      | 97 ± 12      |
|                   | Q2              | 76 ± 26   | 95 ± 8       | 97 ± 10      | 97 ± 10      |
|                   | Q3              | 68 ± 30   | 93 ± 13      | 93 ± 19      | 93 ± 19      |
|                   | Q4              | 79 ± 27   | 98 ± 5       | 97 ± 11      | 97 ± 11      |
| Lower denture     | Q5              | 32 ± 28   | 69 ± 20      | 72 ± 23      | 72 ± 23      |
|                   | Q6              | 33 ± 33   | 72 ± 20      | 84 ± 18      | 84 ± 18      |
|                   | Q7              | 38 ± 34   | 75 ± 21      | 84 ± 18      | 84 ± 18      |
|                   | Q8              | 49 ± 35   | 79 ± 20      | 88 ± 14      | 88 ± 14      |
| Upper denture     | Q9              | 62 ± 32   | 96 ± 10      | 91 ± 20      | 91 ± 20      |
|                   | Q10             | 64 ± 32   | 98 ± 6       | 96 ± 14      | 96 ± 14      |
|                   | Q11             | 57 ± 34   | 98 ± 5       | 95 ± 17      | 95 ± 17      |
|                   | Q12             | 63 ± 32   | 98 ± 4       | 98 ± 6       | 98 ± 6       |
| Expectation       | Q13             | 81 ± 28   | 98 ± 6       | 96 ± 15      | 96 ± 15      |
|                   | Q14             | 61 ± 39   | 98 ± 6       | 95 ± 10      | 95 ± 10      |
|                   | Q15             | 84 ± 25   | 99 ± 4       | 95 ± 17      | 95 ± 17      |
| Beauty and speech | Q16             | 78 ± 30   | 98 ± 5       | 95 ± 17      | 95 ± 17      |
|                   | Q17             | 80 ± 30   | 99 ± 3       | 94 ± 16      | 94 ± 16      |
|                   | Q18             | 83 ± 24   | 99 ± 3       | 97 ± 11      | 97 ± 11      |
|                   | Q19             | 78 ± 29   | 99 ± 3       | 94 ± 21      | 94 ± 21      |
| Importance        | Q20             | 79 ± 30   | 99 ± 2       | 97 ± 13      | 97 ± 13      |
|                   | Q21             | 81 ± 29   | 100 ± 1      | 98 ± 13      | 98 ± 13      |
|                   | Q22             | 79 ± 30   | 99 ± 4       | 97 ± 8       | 97 ± 8       |
|                   | Q23             | 65 ± 36   | 99 ± 4       | 97 ± 7       | 97 ± 7       |

**PDA-T reliability and validity**

**Exper Group**

The internal consistency using Cronbach’s $\alpha$ and average inter-item correlation was 0.95 (range 0.76–0.95) and 0.47 (range 0.57–0.83) (Table 3). The test-retest reliability index
assessed by determining the intraclass correlation coefficients (ICCs) was 0.98, which indicated clinically significant reproducibility. The ICCs of the six subtopics ranged from 0.94–0.99 (Table 4). The results of the assessment of discriminant validity are presented in Table 5. The paired t-test demonstrated that the t₁-PDA-T score was significantly higher compared with the t₀-PDA-T score. The mean summary scores increased from 1539 for the t₀-PDA score to 2155 for the t₁-PDA score. The pooled SD of all the patients was 360, thus, the Cohen’s value of 1.71 indicated a large effect size.

Table 3. Cronbach’s α and Average inter-item correlation coefficients assessed by t₀-PDA (Exper group) scores (N = 54).

| Topics            | Cronbach’s α | Average inter-item correlation coefficient |
|-------------------|--------------|-------------------------------------------|
| Summary score     | 0.95         | 0.47                                      |
| Function          | 0.90         | 0.70                                      |
| Lower denture     | 0.85         | 0.60                                      |
| Upper denture     | 0.93         | 0.77                                      |
| Expectation       | 0.76         | 0.57                                      |
| Beauty and speech | 0.95         | 0.83                                      |
| Importance        | 0.87         | 0.65                                      |

Table 4. Test-retest reliability assessed by t₀ and t₁ patient’s denture assessment (PDA), Exper group, scores (N = 18).

| Topics            | ICC | 95% CI          |
|-------------------|-----|-----------------|
| Summary score     | 0.98| [0.96, 0.99]    |
| Function          | 0.99| [0.97, 0.99]    |
| Lower denture     | 0.98| [0.96, 0.99]    |
| Upper denture     | 0.94| [0.86, 0.98]    |
| Expectation       | 0.97| [0.92, 0.98]    |
| Beauty and speech | 0.96| [0.89, 0.98]    |
| Importance        | 0.99| [0.97, 0.99]    |

Table 5. Results of the paired t-test for t₀ and t₁ patient’s denture assessment (PDA), Exper group scores.

| Topics            | Mean ± SD          | P     |
|-------------------|--------------------|-------|
| Summary score     | t₀ 1539 ± 495      | < 0.00|
|                   | t₁ 2155 ± 119      |       |
| Function          | t₀ 292 ± 105       | < 0.00|
|                   | t₁ 382 ± 32        |       |
| Lower denture     | t₀ 152 ± 109       | < 0.00|
|                   | t₁ 295 ± 77        |       |
| Upper denture     | t₀ 247 ± 119       | < 0.00|
|                   | t₁ 291 ± 22        |       |
| Expectation       | t₀ 226 ± 76        | < 0.00|
|                   | t₁ 295 ± 14        |       |
| Beauty and speech | t₀ 319 ± 106       | < 0.00|
|                   | t₁ 396 ± 11        |       |
| Importance        | t₀ 304 ± 107       | < 0.00|
|                   | t₁ 397 ± 10        |       |
NonExper Group

From the sample size of 66 (at least 46 patients by G*Power calculation), the concurrent validity using Pearson correlation between patients’ demographics and summary score (Table 6) revealed no significant association between clinics, age, sex, and highest education.(27)

| Topics                  | Types of doctor (UG/PG) | Age | Genders | Highest education |
|-------------------------|-------------------------|-----|---------|------------------|
| Summary score           | 0.16                    | 0.03| -0.03   | 0.05             |

*Significant level at 0.05

Discussion

The present study investigated the reliability and the validity of the PDA-T, and then used this self-assessment form to evaluate Thai patients’ satisfaction toward their complete denture experience. The results indicated that the PDA-T can be used to evaluate patient satisfaction with their denture treatment and results.

The study participants in each group had problems based on missing teeth, ill-fitting complete dentures and poor chewing ability in the Exper and NonExper group, respectively. These results indicate that the Exper group focused on how well their complete denture fit. In contrast, in the NonExper group, the primary concern was to gain chewing ability. Furthermore, the Exper group sought treatment due to a poor fitting denture after a period of having their denture (less than five years, n = 10; more than five years, n = 44). Therefore, the minimum years of having a fitting complete denture in this group was five years. The chief complaint in each group indicates that in edentulous patients a well-fitting and functioning denture is more important compared with their psychological and physical needs. Both groups' treatment procedures were supervised by their respective Faculty members, which standardized the procedures between the groups. Therefore, there were no other factors that differentiated the groups in concurrent validity. The educational level of the participants’ data illustrated that most patients in each group were at the Primary-secondary
school educational level. These results suggest patients with a Primary-secondary school education might suffer from tooth loss at an earlier age.

The Exper group demonstrated various denture treatment needs before treatment (t₀). However, the lower denture topic demonstrated the worst satisfaction scores pretreatment. Furthermore, after treatment, the lower denture subtopic average scores were still the lowest score compared with other subtopics in both groups. The lower score of the lower denture’s function may indicate the efficacy of the treatment methods, e.g. an error in tooth arrangement or clinical re-mount. To identify the most sensitive step in denture treatment that affects the denture’s functioning requires further studies that include occlusal schemes and ridge height. The results of the present study demonstrated a high degree of reliability and validity. In the present study, the average inter-item correlation and Cronbach's α was used to determine internal consistency. The Cronbach's α summary score of 0.95 (range 0.76–0.95) indicated similarity between subtopics, which are acceptable for clinical usefulness. Our results were similar to that of another study using the PDA. However, the expectation topic, which comprised 3 subtopics, demonstrated the lowest score (0.76) between topics, which indicated that the number of questions affected the Cronbach's α score. The average inter-item correlation was significantly different between the summary score (0.47) and the beauty and speech subtopic (0.83), demonstrating that the participant’s psychological and physical needs concerns were lower compared with other subtopics. Furthermore, Q16–Q19 were similar, which may account for the highest score of the average inter-item correlation coefficients in the beauty and speech subtopic.

The ICCs of the test-retest reliability are typically determined with a 2–8-week interval between tests. All of the subtopic ICCs in our study were all close to 1.00, indicating that the PDA-T is reliable.
There was a significant difference in the summary score and the six subtopics scores before and after replacing the old dentures for the assessment of validity. The PDA-t score was significantly higher at $t_1$ compared with $t_0$ ($p<0.05$). The greatest improvement was seen in the lower denture topic (approximately two-fold increase), implying the value of lower denture function. The treatment effect might be related to the dentist’s skill in lower denture fabrication. Thus, future studies should include the lower jaw and alveolar ridge anatomical information to better understand the impact of these factors on denture fabrication and treatment results. These results indicate that the PDA-T can detect differences in patients’ self-assessment between previous and new dentures.

The size effect is the amount of change and the indicator illustrates the effectiveness of the treatment. With an effect size of 1.71, this study demonstrated a large significant difference in scores between after-insertion ($t_1$) and before-treatment ($t_0$), indicating that an edentulous patient’s value functional ability more than other factors. However, the interval between completing the questionnaire might have affected the amount of change detected. If the participants completed the questionnaire longer after completing denture treatment, there might be a larger difference between the negative and positive effects of the denture treatment.

There was no significant difference between the patient demographics (sex, age, education, and dentist’s skill level) that might affect the quality of the treatment in any category. There are studies demonstrating that sex affects oral health, suggesting that females might have better oral health compared with males$^{32-36}$. However, our Pearson correlation analysis found no significant correlation between sex and denture function. It may be intuitive to believe that aging is negatively correlated with oral health and their physical condition$^{2, 14, 37}$, however, studies have found no relationship between these factors$^{38-42}$. Therefore, our results indicate that we can improve a patient’s oral health while their physical
condition declines, such as restoring tooth loss with a denture that leads to a better quality of life. Social and economic status may be another factor affecting the oral related quality of life.

An educational index is a tool that is often used to determine socioeconomic status, especially in the elderly who do not have income from work. Prior studies demonstrated that education level positively correlates with oral hygiene related quality of life.\(^{(2, 38, 39, 43-45)}\) However, other studies have not demonstrated a significant association between with educational level patient satisfaction.\(^{(18, 27)}\) In contrast, the present study found a weak association between educational level and denture function. These findings suggest that the satisfaction of edentulous patients receiving a complete denture is controlled by their denture’s function, rather than any demographic aspects. Another aspect is whether the dentist’s skill level affects the denture-wearing patients’ the quality of life, which should be further explored in future studies. The fact that the treatment given between groups was supervised by Faculty members may explain why the dentist’s skill level did not affect the PDA-T results.

The present study demonstrated the excellent reliability and validity of the PDA-T. The PDA-T would be useful in clinical practice for understanding the patients’ opinion on their denture’s function, which important for the dentist to understand to be able to provide the best denture treatment. However, this study has limitation due to the short time between denture delivery and the final follow-up; therefore, additional studies are needed.

**Conclusion**

The present study has demonstrated the reliability and validity of the PDA-T. Complete denture wearers considered denture function more important compared with their psychological and physical needs. It is suggested to use the PDA-T to evaluate the patients’ satisfaction with their denture to generate the optimum treatment results.
Abbreviations

GOHAI: General Oral Health Assessment Index; OHIP: Oral health impact profile; OIDP: Oral Impacts on Daily Performance Index; OHRQoL: Oral Health related Quality of Life; PDA: Patient’s denture assessment.

Competing interests

The authors declare that they have no competing interests.

Authors’ contributions

SN and OK contributed to the design of the study, data collection, data analysis and drafted the manuscript. Both authors read and approved the final manuscript.

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