Patient Reported Outcomes on Different Occlusal Schemes in Complete Denture Wearers

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Abstract

Purpose: To compare patient-reported outcomes among balanced, lingualized, and monoplane occlusal schemes in relation to edentulous jaw classifications. Materials and Methods: This randomized controlled trial was conducted in edentulous patients receiving new complete dentures using balanced, lingualized, or monoplane occlusal schemes. Demographic variables, bone ridge quantity, number of adjustments required after denture insertion, and satisfaction and quality of life (QoL) indices (ie, the Denture Satisfaction Questionnaire [DSQ] and General Oral Health Assessment Index [GOHAI], respectively) were assessed at 1, 2, 4, 8, 12, and 52 weeks. Within-group comparisons at different time points were carried out with Brunner-Langer nonparametric analysis. Furthermore, Kruskal-Wallis test was used to compare distributions of ordinal or continuous variables among the three occlusal scheme groups. Results: A total of 60 subjects (mean age: 68.1 ± 11.1 years; 56.7% men and 43.3% women) were analyzed. All three groups presented significant improvements in DSQ and GOHAI scores between denture insertion and the 1-year follow-up appointment ($P < .001$). There were no statistical differences in the distribution of demographic variables (eg, age, gender, years edentulous, and age of existing dentures) or of bone ridge classifications among the three groups. Similarly, there were no statistical differences in ridge classifications or in the DSQ and GOHAI values among the three groups for both the maxilla and mandible ($P > .05$) over the 52-week follow-up. On the other hand, the number of cases requiring denture adjustments was significantly lower in the lingualized scheme group, as compared to the two other groups ($P = .034$). Conclusion: Within the limitations of
this study, the present findings suggest that the occlusal scheme for posterior teeth did not influence patient-reported subjective outcomes. However, the lingualized occlusal scheme required significantly fewer adjustments. *Int J Prosthodont* 2021. doi: 10.11607/ijp.7402

**Introduction**

The World Health Organization reported that edentulism affects a quarter of the global population over age of 65.¹ Edentulism continues to decrease in affluent countries. Nevertheless, epidemiological research showed that the proportional decrease of edentulism will not result in an actual decrease in the number of edentulous patients due to population growth.²⁻⁵ The demand for rehabilitation of edentulous patients will remain real as less affluent members of society are particularly prone to tooth loss since they favor the least expensive (in monetary terms, certainly not biological) method for dental treatment.⁶ Hence, treating edentulism in an inexpensive and effective way will remain important. Complete dentures are the most common prosthodontic treatment option for managing edentulism.⁷⁻¹⁰ This treatment methodology is not without drawbacks; it is well understood that masticatory function is reduced with complete dentures.¹¹⁻¹³

In order to improve the general function of complete dentures, clinicians have over the last 90 years developed various denture techniques including different types of occlusions: balanced articulation (i.e. presenting bilateral, simultaneous occlusal contact of anterior and posterior teeth in excursive movements), monoplane articulation (i.e. presenting posterior teeth with masticatory surfaces that lack any cuspal height) and lingualized articulation (i.e. presenting maxillary lingual cusps articulating with
mandibular occlusal surfaces in centric occlusion, working and nonworking mandibular positions). \textsuperscript{10}

Various studies have compared the different occlusal schemes. \textsuperscript{14-27} Most of these papers reported significant differences in efficiency and satisfaction among the occlusal scheme groups. However, only two of the aforementioned studies discussed outcomes in terms of maxillary and mandibular anatomy present in the study subjects. \textsuperscript{17, 23}

Despite the fact that previous studies did not find significant differences among occlusal schemes in a randomized clinical trial,\textsuperscript{22} lingualized occlusion has become an increasingly established method for constructing complete dentures with multiple benefits reported.\textsuperscript{14,15,17,18,20,23,25-27} However, it is still unclear if one occlusal scheme is superior in terms of function. Similarly, little has been reported on differences in quality of life and ridge quantities among the three above mentioned occlusal schemes. Finally, studies comparing the three-occlusal schemes for quality of life within follow-up periods greater than 3 months are sparse in the literature.

Thus, the aim of this study was to compare patient reported outcomes among balanced, lingualized, and monoplane occlusal schemes in relation to edentulous jaw classifications. The null hypothesis of the study was that patient-reported outcomes in complete denture wearers is not determined by different occlusal schemes and quantities of the residual ridge in the patients.
**Materials and Methods**

This prospective randomized clinical trial was conducted on edentulous patients requesting new complete dentures. Patients were consecutively referred to the University clinic from the National Services for treatment. When patients attended the clinic, demographic data, medical and dental histories were recorded. The reason for replacement of their existent complete dentures was recorded. Then, extra-oral and intra-oral clinical examinations were conducted by the same clinician. Once completed, the clinician introduced the study and the researcher to the patients. If the latter was interested, the researcher further explained the study, what it entailed and sought the patient’s participation and consent. Patients were provided with a patient’s information package that explained the research protocol, including patient’s rights. The package was taken home and if the patient agreed to participate, a signed consent form was returned back to the researcher on the second clinical visit. The present research protocol was approved by the local Ethics Committee (protocol number: UREC-DP1811005DSG). The CONSORT and Helsinki Declaration guidelines were followed in this investigation. All sixty patients were treated and followed-up by the same clinician (NA) and the dentures were fabricated by a senior dental technologist (MZ). Research data was collected by the main researchers (CG&LB).

**Inclusion and exclusion criteria**

The patients chosen needed to satisfy the criteria, as listed in the Table 1.

**Group allocation**

The first sixty patients that consented were randomly divided into three groups of twenty participants each by the senior dental assistant. For this purpose, simple
randomization was carried-out using computer-generated random numbers (Ramdomizer Fahmy Corporation) in advance of the patients enrolling in the study. The key for the allocation of the occlusal schemes was kept with the senior dental nurse, who communicated the allocated scheme on the laboratory docket once the jaw registration records were sent to the dental laboratory for tooth set-up. The clinician was blinded to the randomization list and choice of the occlusal scheme for the individual patients. Patients were blinded to the type of occlusal scheme provided to them throughout the study. Eight patients were excluded because they could not participate due to mobility/transportation issues. One group of the participating patients received the balanced occlusal scheme dentures, the second group the lingualized occlusal scheme and the third group received the monoplane occlusal scheme.

Treatment Schedule

As part of the clinical diagnosis, digital panoramic radiographs were taken for each patient to examine the alveolar ridges for any pathology. The same radiographs were used to classify the edentulous ridges according to the Lekholm Zarb classification. Two patients were found to have retained roots. Therefore, pre-prosthetic surgery was performed to remove the roots. Denture fabrication followed standard clinical and technical procedures:

Primary impressions with alginate (Hydrogum 5, Zhermack, Rovigo, Italy) were made by the same clinician using stock trays and they were sent to the laboratory. The first set of questionnaires was asked during this appointment. The impressions were poured in type III dental stone (Elite Rock Shera Premium, Zhermack, Rovigo, Italy) to create diagnostic casts and custom trays according to the clinician’s request. Custom trays were first border molded and secondary impressions were taken with addition
silicone (Elite HD+ Zhermack, Rovigo, Italy). The procedure for the casting of the secondary impressions followed the same procedures as the casting of the primary impressions to obtain master casts, which were fabricated to obtain jaw relation records (i.e. occlusal vertical dimension and horizontal relation). In addition, the shade of the teeth was taken and noted on the lab card. Once this record was done, the prostheses were sent to the laboratory. They were disinfected and then articulated on a non-arcon average-value articulator using the split cast technique. The condylar guidance angle was 30° and the incisal guidance angle was 0°. The teeth (Ivoclar Vivadent) were set up in wax in either a Balanced (SR Postaris DCL), Monoplane (SR Orthoplane DCL) or Lingualized (SR OrthoLingual DCL) occlusal scheme, depending on which group the patient was randomly selected in. Once this was done and the proper aesthetics were obtained, the wax set-up was disinfected, packed and sent to the clinic for the try-in.

During the try-in, the clinician tried the wax denture into patients’ mouths. The clinician checked for proper function and aesthetics. Once the clinician was satisfied with the prostheses, a mirror was provided to the patients for verification of the trial dentures. Once approved, the wax dentures were sent to the laboratory to be processed in acrylic resin (Diamond D® Ultra Impact Acrylic, WHW Plastics Ltd, Therm Road, Hull, East Yorkshire, UK) according to standard procedures. The flasks were placed in a clamp, secured tightly and placed in the curing bath for 7 hours. These were left to cure according to the manufacturer’s instructions. The flasks in the curing bath were heated to about 70°C for one to two hours, and then the temperature was raised slowly to 100°C.

Once cured, the dentures were de-flasked, trimmed and remounted to refine the occlusal contacts. The patients received their dentures and a centric relation record was obtained at the same appointment for final occlusal adjustments. Patients were
instructed on their care. They were recalled as previously discussed to assess denture satisfaction and associated oral-health related quality of life over time. For this purpose, questionnaires were filled and function, comfort and speech were reassessed clinically.

Patients were followed-up for a period of fifty-two weeks from insertion stage and records were taken at intervals of one week, two weeks, four weeks, eight weeks, twelve weeks and fifty-two weeks after denture insertion with the help of questionnaires that were asked at each interval by the senior dental assistant. These questionnaires were also asked once before the treatment commenced and this measurement was considered as the baseline of the analyses. The questionnaires used in this study included the Denture Satisfaction (DSQ) and General Oral Health Assessment Index (GOHAI) questionnaires to measure oral-health related quality of life (OHQOL) in the local language.²⁹,³⁰

Data Analysis

Patient demographic data, medical and dental histories were gathered and analyzed. These included age (continuous variable) and the categorical variables presence of medical conditions, oral mucosa health, the reason for tooth loss, categorized years edentulism in both arches, regular wear of dentures and the reason for request of new dentures

The ridge classifications, as measured by Lekholm and Zarb²⁸ was further divided into 2 groups, being A, B, C (good-moderately good ridge) and D, E (poor ridge) for the purpose of analysis. Patients were also asked about denture comfort and adjustments when necessary were provided and measured. Requirement of denture adjustments was recoded into a binary variable.
**Statistical Analyses**

Sample size was initially estimated with the Noehem’s Formula test to give the study a power of 80% at a significance level of 5%, considering a comparison among three identical groups (N=60). All data from the questionnaires were tabulated and analyzed with computer software (SPSS software IL, USA). Differences in the three occlusal schemes were compared with confounding variables as well as the outcome variables, that is the denture satisfaction and GOHAI questionnaires. The DSQ and GOHAI total and subtotal scores were analyzed for normal distributions by using the Shapiro-Wilks test. Absolute and relative frequencies were calculated for categorical variables, while the median, maximum, minimum and range values were calculated for continuous variables. The inferential analysis was conducted in order to identify variables associated with the study groups and their influence on the final patient satisfaction. Normality of data was assessed with the Shapiro-Wilk test. Chi² test was used to assess the association between categorical variables. For longitudinal data that was not normally distributed, the non-parametric Brunner-Langer model was used to assess changes over time and differences within occlusal scheme groups. Furthermore, Kruskal-Wallis test was used to compare distributions of ordinal or continuous variables among the three occlusal scheme groups, in all different follow-up time points analyzed. A P<0.05 significance level was used for all the tests.

**Results**

This study was conducted in 60 patients (average age was 68.1 ± 11.1 years old; range: 34-93 years) who received new complete dentures. 56.7% of the patients were male and 43.3% were female. DSQ and GOHAI total and subtotal scores did not follow
normal distributions (Shapiro Wilk test, p>0.05) and therefore non-parametric models were used. Furthermore, there were no statistical differences in the distribution among the three groups for age, gender, years edentulous and age of existing dentures. The distribution of other variables was also comparable between the three groups. These included the presence of medically-controlled conditions, regular wear of dentures and reason for request of new dentures. (Chi² p>0.05) Patients mainly required new dentures due to reported lack of retention and stability of their previous dentures and for better function (Table 2). Seventy-five percent (75%) of the patients had been edentulous for more than one year, 82% of the patients had previous dentures and 81% used them regularly. No denture stomatitis was observed among the patients. The distribution of the variable reason for tooth loss was statistically significant. There was a higher proportion of tooth loss due to periodontal disease in the balanced occlusal scheme group (Chi² p = 0.047).

Figures 1 and 2 present the distribution of the LZ ridge classification in the three occlusal schemes. According to Figure 1, maxillary ridge quantity E was not present in the Balanced and Monoplane Occlusal Scheme samples. As shown in Figure 2, for the mandibular ridge, Ridge Quantities B, D and E were similar for all groups, while Balanced Occlusal Scheme group had the highest amount of Ridge Quantity C. There were no statistical differences in the distribution of the ridge classes among the three groups for both jaws (Kruskal Wallis test p>0.05).

Figure 3 describes the median number of adjustments for maxillary and mandibular dentures as well as adjustments for each occlusal scheme during and post-insertion visits. 81.8% of the sample required some adjustments to their dentures. The median overall number of denture adjustments, irrespective of occlusal scheme, was
higher for mandibular denture patients (78.2%) when compared to the maxillary denture (56.4%).

When considering the total adjustments for the maxillary and mandibular dentures combined, the lingualized group had the lowest percentage of dentures requiring adjustments, as they had the highest percentage of zero adjustments. The number of cases requiring denture adjustments was significantly lower in the lingualized scheme group, as compared with the two other groups (p=0.034). None of the participants in the lingualized group required more than five adjustments. On the other hand, patients in the balanced and monoplane groups both had up to seven adjustments, and both had a similar percentage of zero adjustments, as shown in Figure 4.

**Denture Satisfaction**

Figure 5 showed that total satisfaction scores improved significantly for all three occlusal schemes. It can be noted that between week 0 and week 1, satisfaction increased significantly. There was no difference in total satisfaction between the different Occlusal Schemes over time (ATS test of Brunner-Langer model p>0.05). However, the present study found a significant improvement over time within the same groups between insertion and the one-year observation period (ATS test of Brunner-Langer model p<0.001). Of particular note, the same trends were observed in specific questions on occlusion (DSQ9) and denture aesthetics (DSQ10,11). Satisfaction on the occlusion increased significantly over time (p=0.005) and was maintained over the one-year observation period. This increment showed a similar slope among occlusal schemes groups and over time (P>0.05 for all time points analyzed). Denture aesthetics
for both arches was high in all cases, with no difference noted between groups at any
time point of observation (ATS test of Brunner-Langer model).

*Oral-health related Quality of Life*

Figure 6 presents the overall effect of the different occlusal schemes on the
OHQOL as measured by GOHAI questionnaire. The OHQOL did not differ
significantly between the Occlusal Scheme groups, but it increased significantly with
time, for all three schemes. GOHAI functional and pain scores were stable over time for
all occlusal schemes (p>0.05). GOHAI psychological scores showed no differences
between groups (p=0.250) and improved over follow-up period within the
groups(p=0.002). All tests conducted were ATS test of Brunner-Langer model.

*Effect of Ridge Resorption on Denture satisfaction and Quality of Life*

The ridge classifications, as measured by LZ classification was further divided
into 2 groups, being A, B, C (good-moderately good ridge) and D, E (poor ridge), their
percentages in the maxillary and mandibular dentures of the 60 patients can be seen in
figure 7.

Patients presented with higher percentages of types A, B and C bone ridges in
the maxillae, while type D and E bone ridges accounted for nearly half the ridges
observed in the mandible. No differences in patients’ denture satisfaction and oral-
health related quality of life scores were found for the recorded jaw ridges among the
three occlusal schemes analyzed herein over the observation time (ATS test of Brunner-
Langer models p>0.05). Patients with poor ridges (D, E) reported significantly less
satisfaction with function of their dentures irrespective of the occlusal schemes, when
compared to good quality ridges (ATS test of Brunner-Langer models p<0.001).
Similar trends were observed for OHQOL scores for maxillae: no differences in the recoded ridges on the patients’ oral-health related quality of life scores for the three occlusal schemes over the observation time (ATS test of Brunner-Langer models p=0.444). Likewise, in the mandibular ridge, there was no significant difference between groups on the quality of life. However, these all improved significantly with time (ATS test of Brunner-Langer models p=0.366).

Discussion
The purpose of study was to compare patient reported satisfaction and quality of life for different complete denture occlusal schemes and to explore any relation with residual ridge anatomy. The three posterior occlusal schemes compared in this study were balanced, lingualized and monoplane occlusal schemes. This was similar to previous methodologies.\textsuperscript{15,16} However, the present study has also examined the outcomes in relation to edentulous jaw classes. The sixty edentulous patients were randomly assigned into the three groups. In order to assess patient satisfaction and quality of life, the patients were given scientifically validated questionnaires, the DSQ and GOHAI at different timepoints. Other studies made use of visual analogue scales to compare denture satisfaction.\textsuperscript{14,23}

A three-month adaptation period is suggested prior to clinical observations in order to allow the patients’ neuromuscular system to adapt to the new dentures, and consequently, allowing for more accurate assessment of oral-health related quality of life and masticatory function when completed after this time.\textsuperscript{31,32} In the present study, patients were observed earlier than the period recommended by the aforementioned citations to include the adaptation period, and the overall denture satisfaction for all groups increased significantly over time within the groups. These results suggest that
we might have experienced the Hawthorne effect during the earlier observations (< 4 weeks), especially in view of the denture adjustments required. Alternatively, one might argue that patients perceive change earlier on, notwithstanding the adjustments needed, and sustained the trend throughout the observation period of the study, once the neuromuscular adaptive period was completed. This suggests that researchers may therefore evaluate patients also during the adaptive phase, as reported elsewhere.\textsuperscript{14,16,21,22,23,24,27,33}

Notwithstanding the changes observed within the groups, we noted no significant differences among the three occlusal schemes. This corroborated literature that suggests that clinical parameters (e.g. the occlusal schemes) might not be correlated with the patients’ satisfaction outcomes.\textsuperscript{34} On the other hand, this is in contrast to a previous systematic review, that concluded that lingualized and balanced groups were likewise suitable and preferred over the monoplane occlusal schemes.\textsuperscript{19} Moreover, the authors noted that a lingualized scheme could be indicated for severely resorbed ridges in terms of mastication and stability. Other studies also stated that balanced and lingualized groups were preferred over the zero-degree group in terms of function, esthetics and cleansability.\textsuperscript{15,16} However, it was noted that ridge anatomy, an important clinical factor, was not discussed in both papers, therefore limiting the conclusions and comparisons to our results.

Patients in this study reported high satisfaction with the dentures’ aesthetics for both maxillary and mandibular dentures during their first review. This trend persisted and continued to increase significantly during follow-up, with no significant difference being noted between the occlusal schemes. This observation differed from other authors who overall noted that patients with lingualized and the balanced groups were superior in terms of aesthetics to the monoplane group.\textsuperscript{16,19,27} The observed differences may be
due to the fact that the present study approached the set-up of the anterior dentition similarly by providing patients a zero-degree incisal guidance if function was not compromised. Similarly, it appears that our patients did not regard aesthetics of the posterior teeth highly leading to the distinct outcomes.

Similar observations were detected for the oral health related quality of life. The latter improved significantly over time for all groups with no significant difference observed between the three groups. This could mean that indeed there are no clinical differences and denture occlusion is not a main contributor for patient-reported outcomes. Alternatively, other factors, such as satisfaction with operator/service or the Hawthorne effect were confounding the results, at least in the earlier stages of the study. However, it is worth emphasizing that these improvements were maintained throughout the follow-up period, suggesting that the patients did perceive and sustain the measured outcomes. Various studies noted an improvement in the quality of life, with some authors emphasizing a major improvement with the upper prosthesis, and in the masticatory ability. Although similarities in the quality of life were observed, it is worth noting that these authors did not discuss clearly the occlusal schemes employed as well as the ridge quantities present in their patients.

The patients’ alveolar ridges were described by the Lekholm and Zarb classification and further dichotomized into 2 groups. As expected, type III and IV ridges were observed mostly in mandibular ridges. This distribution of the ridges, with preponderance of highly resorbed ridges in the arch, are in line with the literature. In the present study, overall patients with poor ridges reported less satisfaction and poorer oral health related quality of life than patients who presented with good ridges. Notwithstanding satisfaction and quality of life increased with time in both groups of ridges. Since satisfaction and quality of life were not different between the three
occlusal groups, our study suggests that there is no occlusal scheme preference for different ridge quantities. In contrast, another previous study reported that lingualized occlusion was preferred over balanced occlusion for patients with severe residual ridge resorption.\textsuperscript{17} However, monoplane occlusion was not included in their study and therefore cannot be compared directly to this study.

Of note, 81.8\% of the sample required adjustments to their prostheses. Patients requested more adjustments in the mandibular denture (78.2\%) when compared to the upper denture (56.4\%) for all occlusal scheme groups. In addition, there were statistically significant differences in the number of adjustments among groups in this study, a result which is in contrast to other studies.\textsuperscript{14,16,19} When considering the total adjustments for the maxillary and mandibular dentures combined, the lingualized occlusal scheme had significantly lower percentage of dentures requiring adjustments, which supports findings from a previous study. Indeed other studies reported that the monoplane occlusal scheme required more adjustments.\textsuperscript{19,54} Interestingly we observed low number of adjustments in our study that were comparable to those reported by previous studies, who observed similar trends in adjustments of their dentures with lingualized and bilateral balanced occlusion.\textsuperscript{14,54} Overall, this suggests that that lingualized occlusal scheme may be the occlusal scheme of choice in complete dentures for diverse ridge quantities.

In conclusion and within the limitations of the study, the present findings suggest that the occlusal scheme for posterior teeth did not influence patient-reported subjective outcomes. The outcomes indicated that patients with poor ridges reported less satisfaction and poorer oral health related quality of life than patients who presented with good ridge. However, no occlusal scheme preference was observed for different ridge quantities. Of note the lingualized occlusal scheme had the lowest percentage of
dentures requiring adjustments. This suggests that the lingualized occlusal scheme may be the occlusal scheme of choice in complete dentures for diverse ridge quantities.

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References


Table 1. Inclusion and Exclusion Criteria

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
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<tbody>
<tr>
<td>Edentulous in both arches for at least 3 months</td>
<td>Reduced ability to perform gross or fine movement as determined during clinical examination</td>
</tr>
<tr>
<td>Patients willing to undergo new complete denture treatment</td>
<td>Patients who could not provide informed consent</td>
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<td>Patients willing to cooperate and return for recalls</td>
<td>Patients not willing to cooperate with the study protocol</td>
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<td>Both male and female participants will be accepted</td>
<td>Partially dentate patients</td>
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<td>Seeking treatment from the University Clinic</td>
<td>Oral pathology requiring immediate care</td>
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<td></td>
<td>Patients who were unable to understand and respond to questionnaires</td>
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<td>Patients with poor oral hygiene</td>
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Table 2: Characteristics of the Study Patients and reasons reported by the patients for replacement of their presenting prostheses with new complete dentures.

<table>
<thead>
<tr>
<th></th>
<th>Balanced Occlusal Scheme</th>
<th>Lingualized Occlusal Scheme</th>
<th>Monoplane Occlusal Scheme</th>
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<tr>
<td>Mean Age (Years ± S.D)</td>
<td>67.5±11.9</td>
<td>68.2±12.2</td>
<td>68.7±9.4</td>
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<td>Gender (M/F)</td>
<td>13/7</td>
<td>8/12</td>
<td>13/7</td>
<td>0.103**</td>
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<td>Years edentulous (Years ± S.D)</td>
<td>12.7±4.3</td>
<td>11.05±4.2</td>
<td>9.8±5.0</td>
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<td>Age of Existing Dentures (Years ± S.D)</td>
<td>7.1±2.8</td>
<td>7.9±2.5</td>
<td>6.3±3.9</td>
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<tr>
<th>Reasons reported by patients for replacement of their dentures with new complete dentures, ***</th>
<th>Balanced Occlusal Scheme</th>
<th>Lingualized Occlusal Scheme</th>
<th>Monoplane Occlusal Scheme</th>
<th>0.901**</th>
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<td>Lost dentures</td>
<td>1</td>
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<td>Recurrent fractures</td>
<td>0</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Dentures not fitting well (lack of stability and retention)</td>
<td>12</td>
<td>10</td>
<td>9</td>
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<td>Unaesthetic dentures</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
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<td>Worn down and loss of chewing function</td>
<td>8</td>
<td>7</td>
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* Kruskal Wallis
** Chi² Test
*** Reasons presented according to the three occlusal schemes investigated in current study.
Figure 1 - Percentage of Lekholm & Zarb Classification for each Occlusal Scheme for the Maxillary Ridge

Figure 2 - Percentage of Lekholm & Zarb Classification for Each Occlusal Scheme for the Mandibular Ridge
Figure 3 – Total median number of Adjustments for each Occlusal Scheme.

Figure 4 – Percentage of Global Adjustments for each Group
Figure 5- Denture Satisfaction Questionnaire Scores

Figure 6– Overall Effect on the OHQOL for the Three Occlusal Schemes
Figure 7- Lekholm Zarb Groups for Maxillary and Mandibular Denture