Subjective Assessment of Satisfaction Degree and Psychosocial Status of Patients with Highly Atrophic Mandible Treated by Implant-retained Over-denture

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Abstract

This study aimed at assessing patient's satisfaction with new optimized conventional complete upper and lower dentures as compared to their previous problematic conventional dentures. A random sample of patients was selected (group 1). Each patient was provided with new optimized conventional upper and lower dentures (group 2), then a subset who were not satisfied with the optimized lower prostheses were provided with two implant-retained lower over-dentures (group 3). Self-assessment questionnaires were voluntarily filled by the participants. Male-female differences were assessed using the two independent samples t-test. Inter-group differences were evaluated using the two dependent samples t-test. Significant differences were found between sexes in group 2, but not in group 3, in the direction of females being less satisfied than males especially with the lower denture, and between the groups in a number of variables in the direction of more satisfaction with the lower dentures among group 3 as compared to group 2. Meanwhile, group 2 and 3 were found to be equally satisfied with the upper denture.

Keywords: *Patient's satisfaction; conventional complete denture; optimized conventional complete denture; two implant retained lower over-denture; atrophic edentulous mandibular ridge*

Introduction

In most societies, the need for complete dentures is increasing due to edentulism. Although, implant-retained overdentures may be considered the best option in the rehabilitation of edentulous individuals, conventionally made complete dentures will remain an important treatment option in the oral health care for the growing elderly population due to economic reasons[1,2]. Residual ridge resorption is a complex biophysical process[3, 4]. More pronounced resorption happen in the mandible than maxilla with an average rate of 0.2 mm annually[5-8].

Treating with atrophied ridges poses a clinical challenge to dentists that associated with unpleasant appearance, pain and discomfort as a result of unstable and non-retentive dentures[3, 6, 9-11].

Clinical experience and dental research reported various problems associated with edentulism[12-14]. To improve health care quality, patient perceptions are crucial, therefore, assessment and treatment outcomes are very important[15]. As well as complete dentures therapy[16-19].

Two main method have been used to assess and evaluate the acceptance of dental prostheses. The first method is objective assessment of masticatory function and speech articulation[20-23]. The second method is by evaluation of patient's perception of treatment by self-assessment tools (questionnaires)[24].

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Edentulous patients showed a moderate level of satisfaction[25-27]. For instance, 3% to 40% of patients were reported to be unable to adapt to their dentures among removable partial dentures wearers 2, 28. Patient satisfaction with complete dentures seems to be a complex socio-cultural issues[29]. Denture quality showed controversial impact on satisfaction. Some authors have observed that most of denture quality criteria do not correlate with patient satisfaction [30, 31]. In another study [32] patients were satisfied despite technical problems, but satisfaction increased as denture quality improved, mainly regarding retention and stability. Other studies firmly presented a strong correlation between denture quality and patient satisfaction [33, 34].

Patient satisfaction with implant retained complete dentures has also been evaluated by subjective and objective method. For example, satisfaction with mandibular implant-retained over-dentures, retained by ITI$^{\dot{O}}$dental implants, was assessed subjectively for six years of use. It was reported that an extremely high proportion (95%) were satisfied with their new prostheses with respect to function, comfort and social rehabilitation [36]. In a multi-center study, Boerrigter et al. [37] carried out a comparative investigation using self-assessment questionnaires in two groups of 150 patients who had long-standing mandibular denture problems. Patients in the first group were treated with mandibular over-dentures retained by two implant fixtures, opposed by optimized maxillary complete dentures. Patients in the second group were provided with new optimized complete dentures in both jaws, as a control group. It was reported that patients treated with implant-retained over-dentures appeared to be more satisfied than the control group, and this was reflected in the overall satisfaction with denture function, aesthetics, comfort and speech. While it was reported that in general terms more than half of the control group was satisfied with the new conventional dentures, it appeared that only a small number of patients were satisfied with the conventional mandibular dentures.

Materials and Method

The study sample consisted (12 females and 18 males) aged between 35 and 75 years, and with a mean age of 60.1 years (SD = 8.4).

Before starting examining the patients, all ethical approval that acquired were signed. Patients then were examined thoroughly and their complaints were recorded and classified according to Cawood and Howell [38] as demonstrated in (Table 1).

Upon clinical examination, they approved to be subjected to preprosthetic surgery. All the pre-prosthetic procedures in form of alveoloplasty were carried out for the five patients. ADMIX technique advocated by McCord and Tyson [35] was used.

After three months of using the new dentures, four of the patients were satisfied with their optimized lower dentures in conjunction with the usage of denture adhesive glue (SUPER COREGA-Ireland) [26].

Three months after later, patients were again asked about their opinions with respect to masticatory function, using the same questionnaire where a comparison was made between the optimized conventional dentures and the implant-retained mandibular over-dentures. The same self-assessment questionnaire was filled by all patients to compare if any significant changes were improved in comparison with optimized conventional dentures (Table 2).

Statistical differences between males and females in the variables considered were examined by the two independent samples *t*-test, and the differences between the groups were assessed using the two dependent samples *t*-test (SPSS, Version 17.0, Inc., Chicago, IL). The 0.05 level was chosen as the threshold value for statistical significance.

Findings: No statistically significant differences were found between males and females in the average overall satisfaction with the lower dentures between group 2 and 3, and with upper dentures between group 2. Although there was a relative difference, the level of satisfaction differs after 3 months between Males and females.

There were no statistically significant differences between the sexes between the third group with regard to all responses to the questionnaire questions. However, significant differences were found between males and females between Group 2 in the mean scores for responses to a number of specific questions asked in the questionnaire.

The two-sample t-test showed that there was no significant difference in the mean overall satisfaction with the upper denture between Group 2 and Group 3. The mean overall satisfaction with the lower teeth

was significantly higher between Group 3 compared to Group 2.

It was found that the average degree of abstinence from wearing upper dentures was zero in groups 2 and 3.

Average scores were found for the following variables: abstinence from wearing lower dentures, refusal to participate in social activities, and negative impact on self-confidence - significantly lower among group 3 compared to group 2.

Median scores for the following variables: pain from wearing a lower denture, slipping of the lower denture while eating, problems with speech, chewing problems, and a denture being considered a foreign body were significantly higher among Group 2 compared to Group 3.

Table 1: Descriptive data about the participants of the study.

Level of education (n)	Duration of edentulism (n)	Shape of the residual ridge (n)			No. of previous dentures (n)		Fabricated by (n)		Faults found in the old CD/s (n)
Illiterate (5)	< 5 yrs (3)		Upper	Lower	< 3 sets	(10)	GP	(25)	No post-dam (5)
School (15)	5-10 yrs (7)	Well-developed	(28)	-	> 3 sets	(20)	DT	(5)	Peripheral Under-extended (15)
College (7)	10-15 yrs (15)	Moderately resorped	(2)	(10)			-	-	Centric off (5)
University (3)	> 15 yrs (5)	Severely resorped	-	(20)					

CD = complete denture; GP = General Practitioner; DT = Dental Technician.

Table 2: Response to questions concerning oral functions of dentures before and after treatment.

Questions	Variables	Optimized (n out of 30)				Implant-OD (n out of 26)			
Scale (0-3)		0	1	2	3	0	1	2	3
Did you wear your dentures all the time?	UD LD	30 -	- -	- 10	- 20	26 26	- -	- -	- -
Does your lower denture cause pain?		-	5	23	2	26	--	-	-
Does your lower denture slip while eating?		-	8	18	4	26	-	-	-
Does your lower denture cause speech problem?		-	14	15	1	26	-	-	-
Do you have chewing problem with your dentures?		-	6	14	10	23	2	-	-
Did you refuse social invitations because of dentures?	Male Female	-	5 -	13 5	- 7	16 -	- 2	-	-
Does the denture affect your self-confidence?	Male Female	-	5 -	13 5	- 7	16 -	- 2	-	-
Do you consider the denture part of your body?		-			30	26	-	-	-
Overall satisfaction (Scale 0-10)	UD LD	> 5 = (30) >5 = (4) <5 = (20) 5 = (6)				> 5 = (26) > 5 = (26)			
Will you do the surgery again?		90-95% (yes)							

OD = over-denture; UD = upper denture; LD = lower denture.

Discussion

The ultimate goal is patient satisfaction[2]. Therefore, restoring mandibular function is crucial. Male-female differences has been previously studied [39]. It has been suggested that females report pain symptoms, and they recall health problems to more than males do[40]. This study revealed no differences between males and females satisfaction with either the upper or the lower dentures among group 2. However, the satisfaction level was greater in males and the difference was almost approaching statistical significance in the case of the upper denture among group 2. Regarding group 3 upper denture, males were significantly more satisfied than females.

Significant Male-female differences among group 2 were found in a number of the mean scores for the responses to the specific questions asked in the questionnaire, where females showed significantly more refusal of engagement into social activities and adverse impact on self-confidence. On the other hand, in another study, both male and female edentulous patients were well-satisfied with their social ability after wearing the prosthesis [41]. Few studies investigating oral prostheses have reported sex differences. Moroi and Coworkers studied the effect of oral prostheses on the quality of life of head and neck cancer patients, and they reported that in both a cancer group wearing maxillofacial prostheses, as well as in a control group wearing conventional dentures, females rated most variables lower than the males [42]. In a study by Panek et al, found that males could adapt more easily to new removable partial dentures than females. The need for ‘‘three and more visits for adjustment after delivery’’ was found to be significantly more common among females than males[43]. In another study, elderly females were less satisfied with conventional dentures than elderly males with regards to aesthetics and ability to chew, but equally satisfied with implant over-dentures[44]. The quality of satisfaction has been found that males were more satisfied than females. There was equal satisfaction level in comfort and social status of both the groups [45]. Females and males differences in perceptions could be explained by either physical or psychological differences between the sexes. It has been suggested that variety of factors may contribute, including hormonal alterations[46], blood pressure[47], and psychological factors[48]. Furthermore, sex role expectancies and anxiety may moderate sex differences[48].

Several long-term studies have confirmed that implant-retained dentures provide satisfactory results with only two implants in the lower jaw [49-51]. Therefore conventional dental treatment is not considered the standard of care[52,53]. In this study, the level of satisfaction was greater, with lower dental implant retention among group 3 than the optimal conventional denture among group 2.

Refraining from wearing the lower denture, refusal of engagement into social activities, and the adverse impact on self-confidence were found to be significantly lower among group 3 as compared to group 2. Kutkut et al.[54] in a systematic review stated the same; treating conventional complete denture wearers with implants to retain their dentures led to obvious improvements of patients’ satisfaction with their oral status as measured by questionnaires and interviews. In the majority of the studies, implant-retained over-dentures were superior to conventional complete dentures with regards to efficacy, satisfaction, and quality of life[49-53].

Conclusion

Within the limitations of the present study, it can be concluded that two-implant retained lower denture is the most satisfactory in case of severely atrophic edentulous mandibular ridge while the optimized upper complete denture provides adequate satisfaction for such patients without the need for dental implants.

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