

## Evaluation of Hygiene, Attitude, and Habits on The Removable Dentures in a Group of Patients

### Bir Grup Hastanın Hareketli Protez İle İlgili Hijyen, Tutum ve Alışkanlıklarının Değerlendirilmesi

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Cite this article as: Gümüşok M, Şimşek E, Erdem M, Demirağ S, Karabey U. Evaluation of Hygiene, Attitude, and Habits on The Removable Dentures in a Group of Patients. Clin Exp Health Sci 2018; 8: 93-7.

#### Abstract

**Objective:** The aim of this study is to evaluate the hygiene methods, attitudes, and habits with regard to the use of removable dentures, whether patients have been instructed by the dentist on how to take care of their dentures, and the interest of the patients about the guidelines given to them after the placement of removable dentures.

**Methods:** This was a cross-sectional hospital-based study carried out using a questionnaire given to 100 patients who were wearing partial and/or complete removable dentures at that time. The questionnaire was designed by the investigators to collect data on socio-demographic characteristics of patients, and hygiene, attitudes, and habits with regard to using removable dentures.

**Results:** It was showed that 31% of patients continuously wore their dentures when sleeping at night. Of the patients, 63% mentioned that they had not been advised about how to clean their dentures by their dentists. There is no statistically significant difference regarding the frequency of cleaning dentures and the rate of removal of the dentures at night before the sleep for age and gender ( $p>0.05$ ). Of the patients, 91% stated that they would be interested in a written guideline explaining how to clean and care for their dentures and giving suggestions for a longer and healthier denture use.

**Conclusion:** It was found that dentists could neglect to inform patients. Dentists should pay attention to instructing patients regarding how to care for their removable dentures after treatment. Giving a guideline to patients might help them use their removable dentures for a longer time and in a healthier way.

**Keywords:** Removable denture, patient, hygiene, guideline

#### Öz

**Amaç:** Bu çalışmanın amacı, hareketli protezlerin kullanımı ile ilgili hastaların hijyen metot, tutum ve alışkanlıklarının değerlendirilmesi, hekimleri tarafından hastalara protez bakımı ile ilgili bilgilendirmenin yapılması ayrıca protez bakımı hakkında tedavi sonrası kendilerine verilecek olan bir klavuza olan ilgilerinin araştırılmasıdır.

**Yöntemler:** Hastane bazlı bu kesitsel çalışma, hareketli protez kullanan 100 hastaya anket uygulanarak gerçekleştirildi. Anket, araştırmacıların, hastaların sosyodemografik özelliklerine, kullanılan hareketli protezler hakkında hijyen, tutum ve alışkanlıklarına ilişkin verileri toplamak üzerine tasarlanmıştır.

**Bulgular:** Hastaların %31'inin sürekli protezlerini taktıkları, gece uyku sırasında çıkartmadıkları bulunmuştur. Hastaların %63'ü diş hekimleri tarafından kendisine protezlerini nasıl temizleyeceği hakkında bilgi verilmediğini bildirdi. Yaş, cinsiyet ve kullanılan protez tipi (bölümlü, total) ile temizleme sıklığı ve gece uyku sırasında çıkartma arasında ilişki önemsiz olarak saptandı ( $p>0.05$ ). Hastaların %91'i protez bakımı hakkında kendilerine verilecek olan yazılı bir klavuzu okumaya istekli olduklarını bildirdi.

**Sonuç:** Diş hekimlerinin hastalarını bilgilendirme konusunda ihmallerinin olduğu görülmektedir. Diş hekimleri tedavi sonrası hastalarını protezlerin bakımı ile ilgili bilgilendirme konusunda daha dikkatli olmalıdır. Hastaların protezlerini daha sağlıklı ve uzun süreli kullanabilmeleri için, protez bakımı hakkında kendilerine verilecek olan bir klavuz faydalı olabilir.

**Anahtar kelimeler:** Hareketli protez, hijyen, hasta, klavuz

#### INTRODUCTION

Partial or complete edentulism is a health problem frequently encountered in advanced ages. Edentation negatively affects aesthetics, psychology, and social life of individuals and decreases the quality of life. In addition, it influences dietary habits and causes chewing dysfunction (1). Nowadays, removable complete and partial dentures are still used in the treatment of missing teeth. The rate of total missing teeth is estimated to range between 7% and 69% among adults across the world (2). Denture plaque and inadequate denture hygiene can lead to stomatitis (Candida infection), which may also be a source of potentially infectious pathogens and play a role in the development of oral malodor, cavities, and periodontitis in individuals having natural teeth. Oral bacteria have been found to be associated with bacterial endocarditis, aspiration pneumonia, gastrointestinal infection, and chronic obstructive pulmonary disease. Moreover, dentures provide a reservoir for microorganisms contributing to the occurrence of these infections. An effective oral hygiene regimen,

This study was presented as a poster at 22<sup>nd</sup> Congress of the Balkan Stomatological Society (BaSS), 4-7 May 2017, Thessaloniki, Greece.

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Received/Geliş Tarihi: 08.05.2017 Accepted/Kabul Tarihi: 24.07.2017 DOI: 10.5152/clinexphealthsci.2017.489

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which contributes to the control of related oral and systemic diseases, is required for the management of denture plaque biofilm (3).

It is acknowledged that patients still do not know enough about denture cleaning and care, and this may be a result of insufficient instructions by dentists (4-7).

Previous studies focused more on patients wearing removable complete denture (RCD), but less on those wearing removable partial denture (RPD) (7). Our study was conducted on both RCD and RPD wearers. Moreover, different from many previous studies, the interest levels of patients about a guideline, like a brochure or a booklet, which would be given to patients by dentists, including information on denture care and points to be considered after denture treatment, were investigated.

The aim of this study was to evaluate the hygiene methods, attitudes, and habits with regard to the use of dentures, and the interest in the patients about guidelines given to them after the placement of removable dentures.

**METHODS**

**Study design and population**

This was a cross-sectional hospital-based study carried out using a questionnaire given to 100 patients (50 females and 50 males; mean age, 61 years; age range, 29-80 years) who applied to Ministry of Health 75th Year Oral and Dental Health Hospital for various dental problems and were still using the removable partial or complete dentures.

The study was approved by the Ethics Committee of the Faculty of Dentistry at Ankara University (10/3;25.05.2016) and was conducted in accordance with the latest version of the Declaration of Helsinki. All patients or legal representatives gave written informed consent before any study-related procedure.

**Study questionnaire**

The questionnaire was designed by the investigators based on previous studies utilizing similar questionnaires (4-9). It aimed to collect data on socio-demographic characteristics of patients and hygiene, attitudes, and habits of using removable dentures. The questionnaire contains the questions on for how long the dentures had been used, whether or not the dentures were worn while sleeping at night, how often the dentures were cleaned, how the dentures were cleaned, whether or not the dentist was visited for control at least once a year even if there were no complaints, whether patients were informed about how to clean and care for dentures at the clinic where dentures were placed, whether the dentist warned about removing dentures before going to bed and reminded not to sleep with dentures, and whether patients would be interested in a written and illustrated guideline explaining how to clean dentures and the points to be considered for a healthier use. The questionnaire was completed by the dentists during a face-to-face interview with the patients.

**Statistical Analysis**

The study data were summarized using descriptive statistics (i.e., frequency and percentage). The chi-squared test was used to evaluate the effects of age, gender, type of dentures, and being instructed by the dentists to remove the dentures during sleeping at night on the frequency of dentures cleaning, and the rate of removal of dentures

during sleeping at night. The relation between gender and information status of patients for cleaning dentures, removing them during night, and their interest about the written guideline were also analyzed by the chi-squared test. Statistical level of significance was set to  $p < 0.05$ .

**RESULTS**

The total number of dentures used by patients was 181 (120 partial and 61 complete). Of the patients, 81 (81%) were using lower-upper removable dentures, and 19 (19%) were using either lower or upper removable dentures. Most of the patients were older than 60 years (54%) and elementary school graduates (58%). Forty-one patients were wearing dentures for over 8 years (Table 1).

**Patterns of patients' caring for their removable dentures**

While 83% of patients cleaned their dentures by brushing, 34% of patients used tap water, 39% used toothpaste with brushing, and 16% used cleansing tablets for cleaning. Out of those patients who removed their dentures at night, 41% kept them in a water-filled container, and 10% soaked them into sodium hypochlorite (immersion), of which only 3 were complete denture users, and 5 were partial denture users.

Sixty-two (62%) patients removed and cleaned their dentures several times a day. As forty-nine patients (49%) removed their dentures during

**Table 1.** Socio-demographics of patients and characteristics of removable dentures

Parameters		Number of Patients (%) (n=100)
Gender	Female	50 (50%)
	Male	50 (50%)
Age	29-44 years	8 (8%)
	45-60 years	38 (38%)
	>60 years	54 (54%)
Education	Illiterate	22 (22%)
	Elementary	58 (58%)
	High school	15 (15%)
	University	5 (5%)
Duration of denture use	1-4 years	29 (29%)
	5-8 years	30 (30%)
	>8 years	41 (41%)
Type of denture*	Upper RCD	36 (20%)
	Lower RCD	25 (14%)
	Upper RPD	57 (31%)
	Lower RPD	63 (35%)
	Total	181 (100%)

RCD: removable complete denture; RPD: removable partial denture  
 \*For the type of dentures, percentages were given per total number of dentures.

**Table 2.** The patterns of denture cleaning and the removal of dentures at night before the sleep with respect to age, gender, and type of denture

	n	Frequency of Denture Cleaning per Day			p*	Removal of Dentures at Night before the Sleep			p*
		Once	Several times	Irregular (every few days)		Always	Sometimes	Never	
Age					0.270				0.829
29–44 years	8	4 (50.0%)	3 (37.5%)	1 (12.5%)		4 (50.0%)	2 (25.0%)	2 (25.0%)	
45–60 years	38	9 (23.7%)	24 (63.1%)	5 (13.2%)		16 (42.1%)	8 (21.1%)	14 (36.8%)	
>60 years	54	17 (31.5%)	35 (64.8%)	2 (3.7%)		29 (53.7%)	10 (18.5%)	15 (27.8%)	
Gender					0.840				0.318
Female	50	10 (20.0%)	36 (72.0%)	4 (8.0%)		27 (54.0%)	11 (22.0%)	12 (24.0%)	
Male	50	20 (40.0%)	26 (52.0%)	4 (8.0%)		22 (44.0%)	9 (18.0%)	19 (38.0%)	
Type of denture					0.410				0.557
Complete	22	10 (45.5%)	10 (45.5%)	2 (9.0%)		14 (63.6%)	4 (18.2%)	4 (18.2%)	
Partial	59	16 (27.1%)	39 (66.1%)	4 (6.8%)		26 (44.1%)	12 (20.3%)	21 (35.6%)	
Complete or partial	19	4 (21.1%)	13 (68.4%)	2 (10.5%)		9 (47.4%)	4 (21.0%)	6 (31.6%)	
Total	100	30 (30.0%)	62 (62.0%)	8 (8.0%)		49 (49.0%)	20 (20.0%)	31 (31.0%)	

\*Chi-squared test

**Table 3.** Information status of patients regarding denture cleaning and removing dentures before the sleep at night, and their interest in the written guidelines

		Female	Male	Total	p*
Were you informed about how to clean your dentures at the clinic where your dentures had been placed?	Yes	18 (36.0%)	19 (38.0%)	37 (37.0%)	0.836
	No	32 (64.0%)	31 (62.0%)	63 (63.0%)	
Did your dentist warn you about removing your dentures before going to bed and not to sleep with dentures during night?	Yes	24 (48.0%)	32 (64.0%)	56 (56.0%)	0.107
	No	26 (52.0%)	18 (36.0%)	44 (44.0%)	
Would you pay attention to a written guideline explaining how to clean your dentures and the points to be considered for a healthier use?	Yes	42 (84.0%)	49 (98.0%)	91 (91.0%)	0.015 <sup>†</sup>
	No	8 (16.0%)	1 (2.0%)	9 (9.0%)	
	Total	50 (50.0%)	50 (50.0%)	100 (100.0%)	

\*Chi-squared test  
<sup>†</sup>Statistically significant difference at the level of p<0.05

every night before the sleep, 31 (31%) never removed their dentures before the sleep. There is no statistically significant difference regarding the frequency of cleaning dentures and the rate of the denture removal before the sleep at night for age and gender (p>0.05) (Table 2). Furthermore, there was no statistically significant difference between the type of dentures used (complete, partial, and complete-partial) and frequency of its cleaning and removal before the sleep at night (p>0.05) (Table 2). However, patients who had been instructed by their dentists to remove the dentures before the sleep at night had a higher rate of removal of dentures before the sleep at night than those who had not been instructed (62.5% and 27.3%, respectively). In comparison, there was a statistically significant difference (p=0.001).

**Informing patients by healthcare personnel**

Ninety-one (91%) patients visit their dentists only when they have a complaint and not for routine controls.

In the clinics where the dentures had been placed, 63 (63%) patients were not explained how to clean the dentures, and 44 (44%) patients were not warned about removing their dentures before the sleep at night (Table 3).

Of the patients, 91 (91%) stated that they would be interested in a written guideline explaining how to clean and care for their dentures, giving suggestions for a longer and healthier dentures use. Male pa-

tients showed a significantly higher interest in the guideline compared to female patients (98.0% and 84.0%, respectively;  $p=0.015$ ) (Table 3).

## DISCUSSION

Plaque, stains, and calculus are accumulated on dentures as in natural dentition. Unsuccessful cleaning of accumulated biofilm from the dentures leads to an increased incidence of localized denture stomatitis (10, 11, 12). The appropriate habit of denture wearing reduces the rate of denture stomatitis (10). Brushing is a simple and effective method of denture cleaning. For maintaining oral health, it is necessary to remove plaque physically from dentures by brushing, but it should be kept in mind that brushing will wear off the acrylic resin (13). In this study, 83% of patients preferred brushing for cleaning dentures. Previous studies (4, 5) also displayed similar results. It was reported that one of the most common methods of denture hygiene was brushing with dentifrice (14, 15, 16). According to Dikbař et al. (9), 40.59% of patients employed brushing with toothpaste. Similarly, we found out that 39% of patients used brushing with toothpaste.

Chemical solutions for denture immersion are used less commonly compared to manual brushing methods (16). Disinfection performed using 1% sodium hypochlorite and peracetic acid changes the properties of roughness and color of the resins (17). It may be suggested that using 0.05% sodium hypochlorite and citric acid-based tablets causes destructive effects (tarnishes and spot corrosion) on the metallic components of the RPD. On the other hand, other tablets and mouth rinses were demonstrated to be suitable for this purpose in the test of surface aspects (18). In our study, 10% of patients soaked their dentures into sodium hypochlorite, and unfortunately, most of them were those wearing RPD.

With regard to the frequency of denture cleaning, this study revealed that 92% of patients cleaned their dentures at least once a day. These results were similar to those of Tuđut et al. (4) and Atay et al. (5) (84.3% and 95.6%, respectively).

There was a positive relationship between the absence of recommendations on oral and denture cleaning and the development of denture-related stomatitis and hyperplasia (16).

It was reported that dentist's patient informing had a positive effect on denture cleaning (4). An increase was observed in the frequency of denture cleaning after educating the elderly patients using old removable dentures about the denture hygiene (19).

Previous studies (5, 9, 16) reported that most denture wearers did not receive instructions from their dentists about how to clean their dentures. In our study, 63% of patients mentioned that they had not been advised by their dentists or any dental care professional about how to clean their dentures. Jagger et al. (14) suggest that many people do not know how to clean their dentures adequately. Moreover, Cakan et al. (7) concluded that the RPD wearers had limited knowledge on denture cleaning and oral hygiene maintenance.

According to Zissis et al. (10), there was a high relationship between the prevalence of denture stomatitis and wearing dentures continuously. A data analysis in this study revealed that 31% of patients continuously wore dentures, while 49% did not wear dentures at night.

According to the results of previous studies, 37.5% (20) and 52.2% (5) of patients, respectively, did not remove their dentures at night. Cakan et al. (7) also showed that 46.9% of patients slept with their partial dentures.

In this study, it was found that dentist's advice on removing dentures at night before the sleep was effective in increasing the number of patients who removed their dentures at night.

In this study, it was demonstrated that 56% of patients specified to have received instructions from their dentists about removing their dentures during night.

Regarding the evaluation of optimum denture fit and function, oral lesions and bone loss, and oral health status, patients wearing dentures should be checked by the dentist, prosthodontist, or dental professional once a year (2). Tuđut et al. (4) recommended that denture wearers should be called by their dentists for control at certain periods. In this study, it was detected that patients generally did not visit their dentists for control in the absence of any complaint related to their dentures. In the study of Marchini et al. (16), 91.9% of patients stated that they had not been asked to come back for periodical control visits.

After denture application, it can be useful to give patients an illustrated guideline like a brochure or a booklet, which includes information on denture care and can be easily understood by patients. In our study, it was revealed that most of the patients (91%) would be interested in such a guideline, and they would be eager to read it.

Particularly in dental clinics that offer care within the scope of the social insurance, it is a great problem that patients receive insufficient education because dentists neglect to inform patients about denture care due to restricted time and patient density.

## CONCLUSION

Although removable dentures are commonly used in the treatment of edentulism in dentistry, patients still display inappropriate habits and attitudes concerning the use of dentures. A guideline that will be given to patients by dentists considering their educational status can be beneficial in this issue. It is a fact that dentists can sometimes neglect to inform patients about denture care and maintenance. For dentures to be used in a healthier manner, dentists should allocate more time for patient education, and they should perform control examinations regularly.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the ethics committee of Faculty of Dentistry at Ankara University (No/date: 10/3; 25.05.2016)

**Informed Consent:** Written informed consent was obtained from all patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author contributions:** Concept - M.G., E.ř.; Design - M.G., E.ř., U.K.; Supervision - M.G.; Resource - M.G., E.ř., M.E.; Materials - M.G., E.ř., M.E., S.D., U.K.; Data Collection and/or Processing - M.G., U.K.; Literature Search - M.G., E.ř., M.E., S.D.; Writing - M.G.; Critical Reviews - M.G., E.ř., M.E., S.D., U.K.

**Conflict of Interest:** The authors have no conflict of interest to declared.

**Financial Disclosure:** The authors declared that this study has received no financial support.

## REFERENCES

- Köse O, Alkurt M, Dilsiz A, Arabacı T. The effects of edentulism on nutritional habits and body weight. *J Dent Fac Atatürk Uni* 2013; 23: 399-407.
- Petersen PE, Bourgeois D, Bratthall D, Ogawa H. Oral health information systems: towards measuring progress in oral health promotion and disease prevention. *Bull World Health Organ* 2005; 83: 686-93.
- Coulthwaite L, Verran J. Potential pathogenic aspects of denture plaque. *Br J Biomed Sci* 2007; 64: 180-9. [\[CrossRef\]](#)
- Tuğut F, Coşkun ME, Özdemir D, Akin H. The comparative evaluation of the factors that affect on cleanliness of the removable prosthesis. *Turkiye Klinikleri J Dental Sci* 2014; 20: 153-61.
- Atay A, Akyıl ŞM, Tukay A, Akova T, Günay Y, Oruç S. Evaluation of effecting factors of denture cleanliness in patients wearing complete denture. *Atatürk Üniv. Diş Hek. Fak Derg* 2008; 18: 8-13.
- Güzel KG, Meşe A, Ayna E. The evaluation of oral structure of 75 patients who were using removable partial denture. *T Klin J Dental Sci* 2002; 8: 61-71.
- Cakan U, Yuzbasioglu E, Kurt H, Kara HB, Turunç R, Akbulut A, et al. Assessment of hygiene habits and attitudes among removable partial denture wearers in a university hospital. *Nigerian journal of clinical practice* 2015; 18: 511-15. [\[CrossRef\]](#)
- Peracini A, Andrade IM, Paranhos H de F, Silva CH, de Souza RF. Behaviors and hygiene habits of complete denture wearers. *Braz Dent J* 2010; 21: 247-52. [\[CrossRef\]](#)
- Dikbas I, Koksall T, Calikkocaoglu S. Investigation of the cleanliness of dentures in a university hospital. *Int J Prosthodont* 2006; 19: 294-98.
- Zissis A, Yannikakis S, Harrison A. Comparison of denture stomatitis prevalence in two population groups. *Int J Prosthodont* 2006; 19: 621-25.
- Ramage G, Tomsett K, Wickes BL, Lopez-Ribot JL, Redding SW. Denture stomatitis: a role for candida biofilms. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004; 98: 53-59. [\[CrossRef\]](#)
- Coco BJ, Bagg J, Cross LJ, Ramage G. Mixed candida albicans and candida glabrata populations associated with the pathogenesis of denture stomatitis. *Oral Microbiol Immunol* 2008; 23: 377-83. [\[CrossRef\]](#)
- Heath JR, Davenport JC, Jones PA. The abrasion of acrylic resin by cleaning pastes. *J Oral Rehabil* 1983; 10: 159-175. [\[CrossRef\]](#)
- Jagger DC, Harrison A. Denture cleansing - the best approach. *Br Dent J* 1995; 178: 413-17. [\[CrossRef\]](#)
- Nikawa H, Hamada T, Yamashiro H, Kumagai H. A review of in vitro and in vivo methods to evaluate the efficacy of denture cleansers. *Int J Prosthodont* 1999; 12: 153-59.
- Marchini L, Tamashiro E, Nascimento DF, Cunha VP. Self reported denture hygiene of a sample of edentulous attendees at a University dental clinic and the relationship to the condition of the oral tissues. *Gerodontology* 2004; 21: 226-8. [\[CrossRef\]](#)
- Fernandes FH, Orsi IA, Villabona CA. Effects of the peracetic acid and sodium hypochlorite on the colour stability and surface roughness of the denture base acrylic resins polymerised by microwave and water bath methods. *Gerodontology* 2013; 30: 18-25. [\[CrossRef\]](#)
- Felipucci DN, Davi LR, Paranhos HF, Bezzon OL, Silva RF, Pagnano VO. Effect of different cleansers on the surface of removable partial denture. *Braz Dent J*. 2011;22(5):392-7. [\[CrossRef\]](#)
- Erol S, Şişman FN, Sezer A, Şentürk İ, Aydın M. The effect of education on mouth and dental health of the elderly at a rest home. *ACU Sağlık Bil Derg* 2016; 2:105-11.
- U Koç Vural, Taş N, Yıldız E, Şener M, Tekçiçek M, Yazıcı R, Attar N, F Yalçın Çakır. The Oral Hygiene And Denture Status Of People Living In A Residential Home. *Clin Dent Res* 2016; 40: 19-25.
- Felton D, Cooper L, Duqum I, Minsley G, Guckes A, Haug S, et al. Evidence based guidelines for the care and maintenance of complete dentures: a publication of the American College of Prosthodontists. *Journal of Prosthodontics* 2011; 142 Suppl 1: 1S-20S. [\[CrossRef\]](#)