

Assessment of hygiene habits and attitudes among removable partial denture wearers in a university hospital

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Abstract

Aims: The aim of this study was conducting a survey of hygiene habits and use of removable partial dentures (RPDs) and correlate them with the social conditions of the interviewees.

Methods: A total of 145 RPD wearers were interviewed by experienced clinical staff using a structured questionnaire. A Chi-squared test was performed to evaluate statistical significance between the variables, and the level of significance was $P < 0.05$.

Results: A total of 72 (49%) patients reported that they had not been well informed by the dentists. Brushing was the most frequent cleaning method (57.6%). 77 (53.1%) patients did not take off their dentures at night. The frequency of cleaning dentures and using cleansing tablet was significantly higher in females than in males ($P < 0.05$). The frequency of denture cleaning, cleaned parts of denture, use of cleansing tablet, removal of dentures at night, frequency of tooth brushing, does not show any significant difference according to age, educational status or duration of denture usage ($P > 0.05$). RPD wearers did not clean their dentures and natural teeth satisfactorily and had limited knowledge of denture cleansing and oral hygiene maintenance.

Conclusions: Hygiene habits and attitudes may be affected by gender, but education level and hygiene attitudes may not always present positive correlation. Dentists should thoroughly inform patients about the harmful effects of overnight wearing and motivate to clean metal parts of RPD's and cleansing tablet use in order to minimize the abrasive effect of widely preferred cleaning method of brushing with toothpaste.

Key words: Denture cleanser, hygiene, overnight wearing, removable partial denture

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Introduction

The importance of proper plaque control and its relation with the long term health of dentures and existing teeth is very well documented in the literature.^[1-3] Inadequate denture hygiene may contribute to biofilm accumulation and colonization of the intaglio surface of prostheses by microorganisms, which engender opportunistic oral infections.^[2] Surveys show that many patients fail to keep their dentures clean and prefer to use dirty dentures.

This situation may be a result of negligence of clinicians in informing their patients about hygiene methods and failure of patients to attend periodic recalls. Lack of optimal hygiene combined with physiological changes has significant negative effect on supporting tissues and may further impair function of removable prostheses. The differentiation in oral hygiene habits and attitudes may be related to number of factors such as education, gender, social status or age.^[4]

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The previous survey studies have mostly focused on the evaluation of the hygiene habits of complete denture wearers. Nishi *et al.*^[3] examined the relationships between the quantity of microorganisms adhering to complete dentures and the frequency of use of a denture cleanser. Takamiya *et al.*^[5] investigated the denture cleanliness of patients who applied to a university clinic for fabrication of new complete dentures. Peracini *et al.*^[6] evaluated the hygiene methods and habits concerning the use of complete dentures. On the other hand, limited number of studies exist in the literature about the oral hygiene habits and attitudes among removable partial denture (RPD) wearers. Fabrication of RPD is still a valid treatment modality for partial edentulism. Therefore conducting a study evaluating the hygiene habits of RPD wearers by means of a survey and its results was considered important. The aim of this study was conducting a survey of hygiene habits and use of RPDs and correlate them with the social conditions of the interviewees.

Materials and Methods

The research project was approved by Istanbul Medipol University research Ethics Committee (protocol number: 10840098-08). This study was conducted among patients who already have RPDs and were willing to be examined in departments of prosthodontics and oral diagnosis and radiology. A total of 145 RPD wearers, who were able to respond a questionnaire, gave fully informed consent and subsequently participated in this study. Sixty-nine subjects (46%) were males and seventy six subjects (54%) were females. The ages of the subjects were between 39 and 82 (mean 57 years).

The subjects were interviewed by experienced clinical staff using a structured questionnaire which sought to identify age, gender, profession, educational status, general health, frequency of visiting a dentist, duration of denture wearing, denture cleaning frequency, methods and status of ever being informed by dentists about denture hygiene maintenance. The questionnaire was based on previously conducted surveys.^[4-7] The data were analyzed by using SPSS 15.0 statistical package program ("SPSS Inc., Chicago, IL, USA"). A Chi-squared test was performed to evaluate statistical significance between the variables, and the level of significance was $P < 0.05$.

Results

Demographic characteristics of the subjects are presented in Table 1. Eighty-nine subjects (61.4%) were primary school graduates, 35 (24%) subjects were high school and 21 (15%) subjects were university graduates respectively. Distribution of subjects regarding age and number of dentures is presented in Table 2. Fifty-one (35%) subjects had dentures that were

Table 1: Distribution of the demographic characteristics of the subjects

	Minimum-maximum	Mean \pm SD
Age	39-82	57.77 \pm 8.67
	n (%)	
Age		
<60	87 (60)	
\geq 60	58 (40)	
Gender		
Man	69 (47.6)	
Woman	76 (52.4)	
Education		
Primary school	89 (61.4)	
High school	35 (31)	
University	11 (7.6)	
Smoking		
Smoker	39 (26.1)	
Nonsmoker	106 (73.1)	

SD=Standard deviation

Table 2: Distribution of subjects regarding age and number of RPDs

	n (%)
Lower RPD	116 (80)
Upper RPD	17 (12)
Both RPD	12 (8)
Age of RPDs (years)	
0-5	51 (35.2)
6-10	50 (34.5)
\geq 11	44 (30.3)
After how many RPDs	
\times 1	91 (62.8)
\times 2	38 (26.2)
$\geq \times$ 3	16 (11)

RPD=Removable partial dentures

Table 3: Frequencies of oral hygiene practices regarding RPD's

	n (%)
Being instructed previously about denture cleaning by the dentist who has fabricated your denture (n=145)	
Yes	41 (28.3)
No	72 (49.6)
Do not remember	32 (22.1)
Frequency of cleaning (n=145)	
1	88 (60.7)
2	29 (20)
3	28 (19.3)
Method of cleaning (n=145)	
Brushing	84 (57.9)
Soaking	49 (33.7)
Brushing + soaking	12 (8.2)
Brush type (n=96)	
Tooth brush	91 (94.7)
Prosthesis cleaning brush	5 (5.3)

Contd...

Table 3: Contd...	
	n (%)
Materials used for brushing (n=96)	
Baking soda	2 (2.2)
Detergent	4 (4.1)
Soap	12 (12.5)
Only water	20 (20.8)
Tooth paste	58 (60.4)
Specifically cleaned denture parts (n=96)	
Clasp and major connector	17 (17.7)
Acrylic	25 (26)
Acrylic teeth	54 (56.2)
Materials used for soaking (n=61)	
Soap	15 (24.6)
Cleansing tablet	24 (39.3)
Baking soda	3 (4.9)
Sodium hypochlorite	16 (26.3)
Other	3 (4.9)
Cleansing tablet use (n=145)	
Yes	32 (22.1)
No	113 (77.9)
Frequency of tablet use/day (n=32)	
1	30 (93.8)
>1	2 (6.2)
Difficulty while cleaning denture (n=145)	
Yes	13 (8.9)
No	132 (91.1)
Most difficult part to clean (n=13)	
Acrylic teeth	4 (23.5)
Acrylic	2 (11.8)
Clasp and major connector	7 (41.2)
Overnight denture wearing (n=145)	
Yes	68 (46.9)
No	77 (53.1)
Reason for overnight wearing (n=68)	
Doctor instructed me to wear overnight	21 (30.9)
I prefer to wear overnight	47 (69.1)
Leaving denture	
Dry	24 (16.6)
Soaking in water	121 (63.4)
Resource of information on denture cleaning (n=145)	
Internet	7 (4.8)
Television	16 (11.2)
Pharmacy	19 (14)
Friend-neighbour	32 (22)
Dentist	71 (48)

RPD=Removable partial dentures

0–5 years old, 50 (34.5%) subjects had dentures that were 6–10 years old and 44 (30.5%) patients had dentures older than 11 years. Data referring to denture cleansing method used, frequency of cleaning dentures, difficulty on cleaning certain parts of dentures were presented in Table 3. Brushing was the most frequent cleaning method (57.6%) where soaking revealed as a less preferred method (33.7%).

Table 4: Frequencies of oral hygiene practices regarding natural teeth	
	n (%)
Frequency of brushing remaining teeth (n=145)	
0	35 (24.1)
1	65 (44.8)
2	26 (17.9)
3	19 (13.1)
Materials used for brushing (n=145)	
None	30 (20.7)
Toothpaste	115 (79.3)
Flossing (n=145)	
Yes	7 (4.8)
No	138 (95.2)

Table 5: Relationship of frequency of cleaning dentures and gender			
	Gender n (%)		P
	Man	Woman	
Frequency of cleaning dentures			
1	42 (60.9)	46 (60.5)	0.046*
2	17 (24.6)	12 (15.8)	
3	10 (14.5)	18 (23.7)	

*P < 0.05

Table 6: Relationship of frequency of cleaning dentures and tobacco use			
	Tobacco use n (%)		P
	Yes	No	
Frequency of cleaning dentures			
0	10 (25.6)	9 (8.5)	0.047*
1	22 (56.4)	66 (62.3)	
2	2 (5.1)	8 (7.5)	
3	5 (12.8)	23 (21.7)	

*P < 0.05

Table 7: Relationship of overnight wearing and number of dentures				
	Number of denture n (%)			P
	First denture	Second denture	≥ third denture	
Overnight wearing				
Yes	35 (38.5)	24 (63.2)	9 (56.3)	0.027*
No	56 (61.5)	14 (36.8)	7 (43.8)	

*P < 0.05

Mostly (56.2%), the acrylic teeth part of dentures were cleaned, followed by the pink acrylic part (26%), clasps and major connectors (17.7%) respectively. Incidence of denture cleanser usage in tablet form is 22.1%. Seventy seven subjects (53.1%) wear their dentures overnight. The rate of the subjects who have reported brushing their remaining teeth once a day while cleaning their dentures

was 44.8%. Toothpaste was the most frequently used material while brushing and 95% of the subjects did not floss [Table 4].

The frequency of cleaning dentures, brushing natural teeth and using cleansing tablet was significantly higher in females, than in males ($P < 0.05$) [Table 5]. Denture cleaning was significantly higher among cigarette or any other tobacco consumers than nonsmokers [Table 6]. Removal of dentures at night is significantly lower among the subjects who use their second or further denture ($P < 0.05$) [Table 7]. The frequency of denture cleaning, cleaned parts of denture, use of cleansing tablet, removal of dentures at night, frequency of tooth brushing, does not show any significant difference according to age, educational status or duration of denture usage ($P > 0.05$).

Discussion

Denture cleansing materials and methods have been the subject of research over the years. However, limited number of studies focused on hygiene maintenance of RPD's. The results of this study presented the hygiene habits and attitudes among a group of 145 RPD wearers. Majority of the subjects were younger than sixty, and almost 30% of the subjects were using RPD's more than 10 years, which might implied that subjects received their first RPD's at their 40's. In their survey among 1545 Turkish subjects, Dogan and Gökalp^[4] reported that the percentage of having 21 or less teeth were 87.6% in the age group of 65–74 year olds in 2004.

The relation between socioeconomic level, education, and oral health status has been presented in previous studies.^[4,8,9] Although it was not a clear assumption, this study also presented that prevalence of partial edentulism among young people was high and among other variables, the level of education affected individual's access to proper dental care.

The results showed that 30.3% of the subjects had been using the same RPD's for over 10 years, which was higher than reported results of previous studies.^[6,10] In this study, brushing with toothpaste was the most preferred method of cleaning, followed by soaking and combination of both methods. This finding was similar to that of Kulak-Ozkan *et al.*^[11] and Marchini *et al.*^[12] In accordance with Veres *et al.*,^[13] brushing only with tap water without using any cleaning agent was also common. Although, it has been claimed that brushing with toothpaste has an abrasive effect on acrylic resin, Dikbas *et al.*^[14] reported brushing as the sole method of cleaning owing to its simple use and cost effectiveness. It was determined that soaking in cleansing tablet and sodium hypochlorite (NaOCl), were the most used cleansing agents. NaOCl is an

effective chemical disinfectant, which is easy to provide as a household cleaning agent.^[15] On the other hand, it has a bleaching effect on acrylic resin and corrosive effect on metal parts of dentures.^[16] Felipucci *et al.*^[17] reported that NaOCl promoted the oxidation of the surfaces and thus leading to spot corrosion, therefore it may not be suitable for cleaning of RPD.

Lower rate of cleansing tablet use in this study may be attributed to relatively higher cost and lack of consumer awareness of the product. The data collected here showed that soaking in chemical solutions was a less frequently used method of cleaning than manual brushing method, which is in accordance with Marchini *et al.*^[12]

Studies show that some denture wearers experience difficulty while cleaning their dentures.^[8,11] The subjects reported that, they gave attention to clean acrylic teeth first, followed by acrylic parts of the denture and clasps and connectors. Peracini *et al.*^[6] reported that internal labial flange, the inner surface, and acrylic teeth were the most difficult regions of complete denture to clean. In this study, the clasps and connectors were reported to be the most difficult parts of the RPD's to clean. This result emphasizes the importance of giving instructions about cleaning metal parts of RPD's.

The results of this study showed that almost half of the subjects wear their RPD's overnight in accordance with previous studies.^[7,14] The overnight wearers reported that their dentists instructed them to wear overnight, which was an interesting result in terms of hygiene habits. Overnight wearing did not show a significant difference according to age, educational status. Akar and Ergül^[18] also did not observe a significant relationship with the level of education and overnight wearing. Our results are similar.

Almost half of the subjects reported that they had not been instructed previously about denture cleaning methods by the dentist who has fabricated the denture. On the other hand, the subjects wearing their first RPD's more than 5 years and might not have remembered clearly whether being instructed or not. In compliance with the results of previous surveys, this result revealed that large number of patients need being better instructed how to use and clean their dentures.^[11,18,19] Resource of information on denture cleaning was mostly dentists, followed by friend-neighbor, pharmacy, media and internet. This result revealed that beside dentists, patients take notice of the experiences of friends or neighbors and put recommendations of pharmacists into practice in terms of denture hygiene.

The frequency of cleaning dentures, brushing natural teeth and using cleansing tablet was significantly higher in females, than in males. The variation in gender based differences may be attributed to awareness and motivation

of the female subjects. In accordance, Nishi *et al.*^[3] reported that gender was significantly correlated with the quantity of microorganisms, and the quantity of microorganisms in dentures worn by women was significantly lower than in those worn by men. The subjects using tobacco products tend to clean RPD's more frequently than nonusers. This result may possibly be explained by concern of removing nicotine stainings on dentures.

There are a number of limitations of this study. The patients participating in this study were selected from one university hospital. In addition, the cleanliness of the RPD's and the status of denture bearing soft tissues have not been scored. Therefore, further studies are needed for thorough understanding of how the relation of hygiene habits and attitudes of RPD wearers and social conditions are affected by these variables.

Conclusion

Within the limitations of this survey and its population, it may be concluded that the majority of RPD wearers did not clean their dentures and natural teeth satisfactorily and had limited knowledge of denture cleansing and oral hygiene maintenance. Hygiene habits and attitudes may be affected by gender, but education level, and hygiene attitudes may not always present positive correlation. Dentists should thoroughly inform patients about the harmful effects of overnight wearing and existing microbial plaque and debris on dentures to the oral mucosa. Patients should be motivated and instructed about cleaning metal parts (clasps and connectors) of RPD's and cleansing tablet use in order to minimize the abrasive effect of widely preferred cleaning method of brushing with toothpaste. Regular recall appointments and periodical instructions may help patients to understand benefits of denture hygiene.

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