

# Hygiene, ways of storage and lifetime of removable dentures

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Krawczyk J, Bożyk A, Kiworkowa-Rączkowska E, Berger M, Bakalczuk M, Szkutnik J, Pietryka-Michałowska E, Wdowiak A, Sapuła M. Hygiene, ways of storage and lifetime of removable dentures. *J Pre-Clin Clin Res.* 2015; 9(1): 54-56. doi: 10.5604/18982395.1157577

## Abstract

Hygiene plays an important role in patients who use removable dentures. The proper way of cleaning and storage also provides better health of oral cavity tissues as well as for the remaining teeth. The research involved 162 patients, 133 women and 29 men, aged 60-90, with different levels of education, the majority with secondary education. All patients were using removable dentures. 85.8% declared earlier use of dentures, and a half of the patients had used dentures for no more than 7.5 years. A considerable percentage (33.95%) used dentures for the whole day. Storing in a container with fluid was used by 25.93% of the respondents. Over 70% used toothpaste to clean their dentures and about 14% immersed them in special preparations, e.g. CoregaTabs, while over 8% used soap. Among patients who cleaned their dentures, the majority cleaned them once a week (75%) and the minority - twice a week (25%). The greatest percentage of patients cleaned their dentures with a toothbrush and toothpaste, which is not recommended due to occurring microabrasions. It is recommended that patients should be educated regarding prosthesis hygiene and regular follow-ups.

## Key words

Denture, partial removable, hygiene, denture cleansers

## INTRODUCTION

Currently, the development of implant prosthetics has increased the scope of supply capabilities for the edentulous parts of dental alveoli by means of fixed dentures. However, the demand for partial and full dentures is still very high. In connection with the ever-increasing health, awareness of the society and the need for better appearance created by mass media, many people are looking for help with a prosthodontist. For those who cannot afford fixed dentures due to very small amount of teeth left, as well as for financial reasons, a removable dentures remain the only viable solution.

With the appearance of removable dentures in the life of a patient, a new problem emerges (aside from conforming to the use of restoration), namely cleaning, storing and disinfection of dentures. Various researchers point out that a lot of patients do not clean their dentures or do that incorrectly - many use them for a full day without a break. [1, 2] A great percentage of patients say that they have not been informed on the ways of dentures cleaning and storing.[3]

## MATERIALS AND METHOD

The research involved 162 patients, aged 60-90, who use removable dentures. The mean age of the surveyed population was  $70.4 \pm 6.5$ . A half of the patients were not aged above 69

( $Me=69$ ), the majority were 66 ( $Mo=66$ ;  $n=17$ ). From the analysis of the coefficient of variation -  $V=9.3\%$  for the 'age' variable, it may be inferred that patient diversity for this feature is narrow. The survey involved 133 women (82.1%), aged 60-90, and 29 men (17.9%), aged 62-88. The mean age of the women was  $70.1 \pm 6.5$ , and for the men -  $72.2 \pm 6.4$ . The observed differences were not statistically significant (Student's t-test = - 1.67;  $df=160$ ;  $p=0.096$ ).

The least numerous group comprised those having primary education and those with a Bachelor's Degree, - 3.1% ( $n=5$ ) and 5.6% ( $n=9$ ), respectively. The most numerous group were consisted of those with secondary education and those with a Master's Degree - 40.1% ( $n=65$ ) and 35.8% ( $n=58$ ), and post-secondary education - 15.4% ( $n=25$ ) (Fig. 1). Most of the surveyed live in a city with more than 200,000 residents - 90.1% ( $n=146$ ), followed by those living in towns with up to 50,000 residents - 4.9% ( $n=8$ ). The lowest percentage was been observed among people living in towns with up to 20,000 residents - 3.15% ( $n=8$ ), and in villages - 1.8% ( $n=3$ ). Data collected were analyzed on the basis of income per family

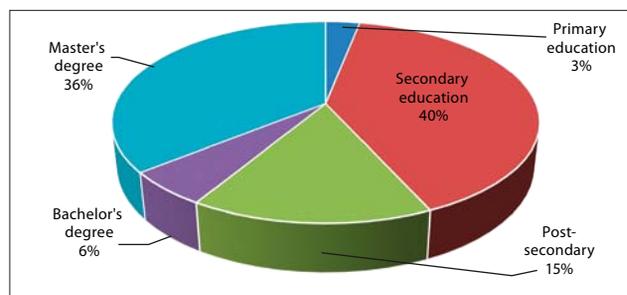


Figure 1. Education level of patients using removable dentures (%)

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Received: 25 February 2015; accepted: 02 June 2015

member. The first category comprised patients whose income did not exceed 500 zł – only one patient (0.6%). The second income category did not exceed 800 zł – only three people (1.9%). The next two categories were more numerous – up to 1,000 zł (14.2%; n=23); up to 1,500 zł (24.1%; n=39), and above 1,500 zł (59.3%; n=96).

**Statistical analysis.** The obtained data were subject to statistical analysis. The values of the examined parameters for quality features were characterized by means of numerosness and percentage, but measured using a ratio scale by means of location and spread.

The Student's t-test with grouping variable was used to determine differences for quality features between the two groups, whereas the one-way ANOVA test was used to discover differences between three groups. To analyze dependency between the examined quality features, Pearson's chi-square test was used. Furthermore, in order to ascertain the impact of a few variables (predictors) on the dependent variable, the multi-factor logistic regression was employed. The inferential error, and the associated significance at  $p < 0.05$ , was assumed at 5%, which demonstrates the existence of statistically significant differences. The database of the analyzed data and statistical analyses were carried out using Statistica 10.0 software (StatSoft).

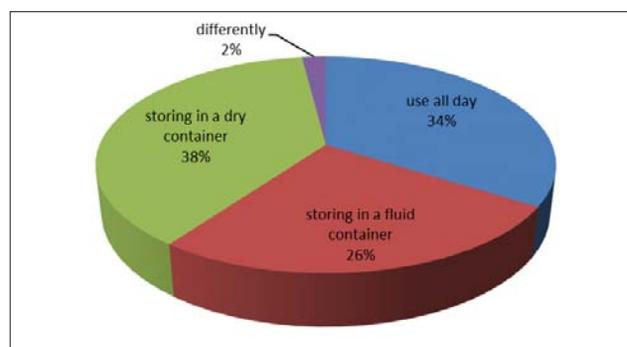
## RESULTS

From among 162 patients who used removable dentures, 85.8% (n=139) of them declared the earlier use of dentures. Information on the life-time of former dentures was obtained from 80 of the surveyed patients (57.55%). The life-time had a wide scope of variance, namely from 6 months to 40 years; coefficient of variation –  $V=84.49\%$ . The mean life-time of dentures was  $10.37 \pm 8.76$  in years. A half of the patients had used dentures for no more than 7.5 years. The majority cleaned their dentures using:

- toothpaste (72.84%; n=118);
- soap (8.64%; n=14);
- washing-up liquid (2.47%; n=4);
- special preparations, e.g. Corega Tabs (14.20%; n=23);
- did not use anything (1.85%; n=3).

The question 'How often do you clean your dentures?' was answered by 24 patients, who amounted to 14.81% of all of the surveyed using removable dentures. Most of the patients said they cleaned their dentures once a week (75%; n=18), and the minority – twice a week (25%; n=6). In the next question, the patients had to provide an answer to 'How do you store your dentures at night?' The majority (38.27%; n=62) stored their dentures in a dry container, a big percentage (33.95%; n=55) used their dentures for a whole day. 'Storing in a container with fluid' was chosen by 25.93% (n=42) of the respondents. The rest of the surveyed chose 'differently', thereby not providing an exact answer (Fig. 2).

In order to conduct a statistical analysis of the influence of selected variables on the method of using removable dentures, the patients were divided into two groups: 1) patients who use their dentures for a whole day, 2) those who store their dentures in a container. The analysis excluded patients who answered 'differently' in the respect of storing. It was found that women use their dentures statistically significantly more



**Figure 2.** Ways of storing dentures (%)

for a whole day (37.69% vs. 20.69%), whereas men preferred storing in containers (79.31% vs 62.31%) (Pearson's chi-square test = 3.28; df=1;  $p=0.048$ ) (Tab. 1).

**Table 1.** Gender and ways of using removable dentures

No. of respondents - 162 No. of marked cells > 0 (no mark for boundary sums) Excluding respondents storing dentures 'differently'				
	storing dentures	gender F	gender M	Total
n	uses for a full day	49	6	55
% of column		37.69%	20.69%	
n	storing in containers	81	23	104
% of column		62.31%	79.31%	
n	Total	130	29	159

Another statistically significant influence on the way of storing dentures is the earlier use of removable dentures. It was determined that patients who had previously used prosthetic restorations statistically significantly more stored their dentures in a container (67.15% vs 54.55%) (Pearson's chi square=5.33; df=1;  $p=0.039$ ) (Tab. 2).

**Table 2.** Influence of earlier use of removable dentures on the method of using current prosthetic restorations

No. of respondents - 162 No. of marked cells > 0 (no mark for boundary sums) Excluding people storing dentures 'differently'				
	Storing dentures	did not use dentures previously	used removable dentures previously	Total
n	uses for a full day	10	45	55
% of column		45.45%	32.85%	
n	storing in containers	12	92	104
% of column		54.55%	67.15%	
n	Total	22	137	159

## DISCUSSION

It should be widely known that the visit for obtaining a prosthetic restoration should not be the last, but the first. The task of a dental prosthetist is to appoint follow-ups at clearly specified periods of time, and the assessment of dentures, dentition and patient-led hygiene should be based on those

follow-ups. It be specified whether the denture is performing its function or needs to be changed.

It cannot be denied that the wearing-down of prosthesis and the release of residual monomer from the materials results in time in the worse fitting of the prosthesis, as well as causing the development of dental plaque. Research conducted on patients using removable dentures shows that the main factor affecting the occurrence of inflammation is omission of hygiene of dentures, denture-induced lesions and their age [4, 5, 6, 7, 8].

Own research demonstrates that the life-time of dentures varies from 6 months to 40 years. Peracini [9] et al. show that 24% of both upper and lower dentures are used for more than 20 years. In the population of India [4], patients most often used dentures between 5 – 20 years (46%), and 32 % – over 10 years. In Turkey, from among 234 patients, 32% of the surveyed used dentures from 11 – 30 years, and 1.3% – over 31 years [1]. Coelho [10] has shown that the majority of dentures in patients with denture stomatitis had used their dentures for over 20 years. In nursing homes in the Greater Poland province, the mean time of prosthesis use was 10 years [11].

Own research among the respondents who cleaned their dentures showed that 75% stated that they clean them once a week, and 25% stated that they did so twice a week. Research conducted at the University of Istanbul in Turkey yielded the following results: 13.2% of the surveyed said they clean their dentures once a week, whereas 10% of them – 2–3 times a week [1]. Own research also demonstrates that 1.85% of the respondents do not clean their dentures.

To minimize the risk of denture stomatitis, the patient should remove removable dentures for about 6 – 8 hours a day [12]. Whole-day use of dentures was practiced by 33.95% of the surveyed, in Dikbas et al. [1] – 41.5%, Marchini – 74%, Baran – 55.2% [2], and Evren et al. – 68.1% [13].

It has been noted that brushing (without abrasive solutions) and dipping in cleaning preparations are the most efficient ways of reducing the occurrence of prosthetic denture stomatitis [14, 15]. Own research indicates that the way most often used for prosthesis cleaning was using a toothbrush with toothpaste (72.84%). [10] Coelho shows that this method was used by 80% of the respondents, and 7% used a toothbrush and soap. Toothbrush with toothpaste was used by 84.91% of the surveyed in research conducted in Brazil [9], which is similar to the results obtained by Kulak-Ozkan [16] and DeCastelluci [17], 40.59% in Turkey [1] and 48.4% in the survey by Baran [2].

A percentage of respondents (14.20%) use special preparations, e.g. Corega Tabs. In the survey by Baran – 5.8% [2]. A survey carried out in Brazil showed that 8.1% of patients remove their dentures at night. [3], 25.8% – store them in a dry container [3], and 38.27% in own research. 25.93% of the respondents store dentures in a water container, in comparison to 66.1% in Marchini [3].

Approximately 10% of patients in the research by Coelho considered dipping the dentures in a glass of water with cleaning solutions, e. g. sodium hypochlorite, peroxide, and ultimately disinfecting in boiling water or alcohol as proper prosthesis hygiene. Kulak-Ozkan points out that dipping dentures in water was employed by 17% of the surveyed [16].

## CONCLUSIONS

A considerable number of patients use dentures for a whole day which, as well as low frequency of cleaning, furthers the occurrence of denture stomatitis. The greatest percentage of patients cleaned their dentures using a toothbrush with toothpaste, which is not recommended due to occurring microabrasions. It is recommended that patients should be educated with regards to prosthesis hygiene and regular follow-ups.

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