



ORAL HYGIENE HABITS IN COMPLETE DENTURE WEARERS

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ABSTRACT

Aim: The aim of the present research is to establish the frequency and methods of cleaning used by patients with complete dentures.

Material and Methods: A survey was conducted between 2016 and 2019 among 96 patients (54 female and 42 male). This study was carried out at the faculty of dental medicine, Medical University – Sofia, during the students' classes in Clinical Prosthetic Dental Medicine and Oral Surgery. A survey card was prepared, including questions addressing the period of total edentulism, a period for rehabilitation with complete dentures, methods and frequency of cleaning and types of hygienic products used by the complete denture wearers. Descriptive statistics, graphical analysis, chi-square test and correlation analysis were computed in R.

Results: Only 12 % of the respondents clean their dentures properly. Nearly 60% of the patients report a widespread but incorrect cleaning method using toothbrushes and toothpaste, and more than 25% use inappropriate, old, and disregarded hygienic means. 65% clean their dentures twice per day. The research showed a strong positive correlation between age and the time wearing dentures.

Conclusion: The findings from the current survey suggest that complete denture wearers are either unaware or negligible towards the proper maintenance of their prostheses.

Keywords: complete edentulism, oral hygiene, denture cleaning tablets,

INTRODUCTION

More than 50% of the persons in Bulgaria aged 60 years and above use removable dentures, and 24% of them are completely edentulous. 98 % of these patients have at least one extracted tooth, and they need some prosthetic treatment. In the world population, 600 million people aged 60 years and above, and their number was expected to double by 2025 [1, 2].

Complete dentures are the most often way for the rehabilitation of complete edentulism. This treatment is successful only when the patients use correct dentures and have normal oral hygiene [3, 4]. Appropriate denture hygiene is a very important factor for maintaining mucosal tissue health

the overall health, especially in cases of elderly patients Food particles located between the denture and the mucosa covering the mandible and maxilla bones or between the denture and the palate allow multiplication of *Candida* spp. and bacteria, which can cause denture stomatitis and other mucosal inflammations. The acrylic resin dentures surface is porous and rough, which is a great area for the microorganisms to adhere and grow. This may not be well aesthetically and not comfortable, cause of the non-good taste and foul smell from the mouth. Oral health diseases related to prostheses depend upon the well-fitting surface, normally adjusted occlusion and cleaning and hygiene habits of the denture wearers [5, 6, 7].

The regular and correct cleaning of dentures is one of the most important things of oral hygiene for patients using complete dentures [8]. The dentures used predisposes the wearer to oral mucosa inflammation; it is a comfortable area for many potential pathogens, causing microorganisms. The unclean dentures are typical for older patients, and their hygiene and health are worse than younger. The dentures should be cleaned up every day with non-abrasive denture cleaning products, mandatory out the mouth. It should not be immersed for more than 10 minutes in bleaching. The correct washing of the dentures maybe not be the most important for some denture wearers. For these patients, a quick brushing and occasional five-minute soak might be the extent of their denture care, and some of them might not even clean them. These not-good care habits develop oral health-related problems like stomatitis, malodor, bacterial endocarditis and fungal infections [9, 10, 11]. Most of the denture wearers used water with a pure brush for cleaning dentures. The frequency of cleaning with cleansing solutions was also not high. The electrosonic method for the plaque reduction on complete dentures is no more effective than the usual cleaning methods usually used by patients, but the sonic and soaking methods are well effective. Dentures can be cleaned mechanically, chemically, or like a combination of these two methods. Effective disinfection may be reached with 0.5% sodium hypochlorite. The greatest reduction in the roughness of the denture surface may be reached using Protefix cleaning tablets and ultrasonic cleaner. The control of the bacterias by traditional mechanical methods such as brushing may be influenced by improving the manual skills of the denture wearers [12, 13, 14, 15].

Many products for chemical cleaning of dentures are widely available - alkaline peroxides, alkaline hypochlorites, inorganic acids, disinfectants, and enzymes. Other authors suggest sodium hypochlorite, white vinegar, and 0.12% chlorhexidine digluconate. These products showed antimicrobial effects similar to 1% sodium hypochlorite (positive control). The 0.2% peracetic acid and 0.05% sodium salicylate solutions were ineffective against bacterial growth, while enzymatic detergent and alkaline peroxide achieved a nice effect [16,17, 18]. The cleaning tablets are used by 48% of the patients investigated by Hadzipaziz-Nazdrajiz [19]. The liquid where dentures were held was tap water in 52% of cases, 6% held dentures in water plus a cleaning tablet every night, 13% baking soda solution, and 3% of the participants never got dentures out of their mouth. Szalewski's [20] investigation showed that 292 persons (90.9%) clean their dentures with toothpaste, 12 patients (3.7%) use soap, 3 persons (0.9%) – use dishwashing liquid and 14 people (4.4%) – other products. The same survey showed that almost 2/3 of the surveyed population – 239 persons (74.5%) did not disinfect their removable dentures, and those who disinfected their dentures most commonly used dentrifice – 46 persons (14.3%) Corega Tabs® tablets – 26 people (8.1%), hydrogen peroxide – 5 people (1.6%), baking soda – 4 people (1.2%) and boiling water – 1 person (0.3%) [19].

There were great differences in cleaning habits among educated compared to noneducated participants. The teaching of the patients in dentures hygiene is very important, and it is a part of the fifth clinical stage of dentures fabrication-delivering the dentures to the patient [20, 21].

The role of the dentist is to control the local factors causing mucosal inflammation, and the oral health of the complete dentures wearers could be improved with the help of the dentist [22].

MATERIAL AND METHODS

A survey was conducted between 2016 and 2019 among 96 patients (54 female and 42 male). This study was carried out as a personal interview at the faculty of dental medicine, Medical University – Sofia, during the students' classes in Clinical Prosthetic Dental Medicine and Oral Surgery. The survey card is presented in Fig. 1.

Fig. 2. Participants wore complete dentures for a mean of 6.68 ± 6 years with a minimum of 2 months and a maximum of 23 years.

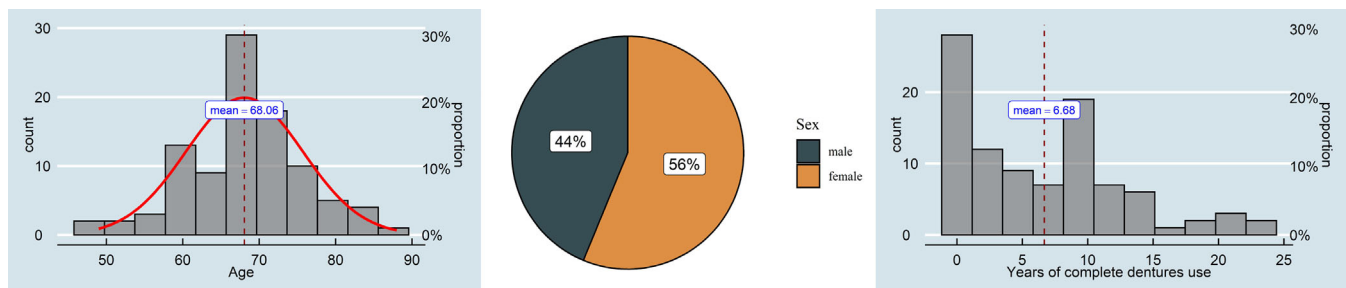


Fig. 1. Questionnaire

Name:

Age:

Gender:

Since when are completely edentulous?

Have you used complete dentures before?

How long have you used them?

How do you clean your dentures?

How often do you clean your dentures?

Do you use tablets for disinfection of your dentures?

How often do you use denture cleansing tablets?

Signature: Date:

The first three questions characterize the condition of the completely edentulous patients - the duration of the condition, treatment, and duration of prostheses usage. Questions 4-7 address the hygienic habits of the patients and cover the methods, means and frequency of cleaning. Each participant received a written and oral explanation stating the purpose of the study and signed informed consent.

Statistical computations were done in R. Descriptive statistics, graphical analysis, t-test, chi-square test and correlation analysis were used to characterize the sample.

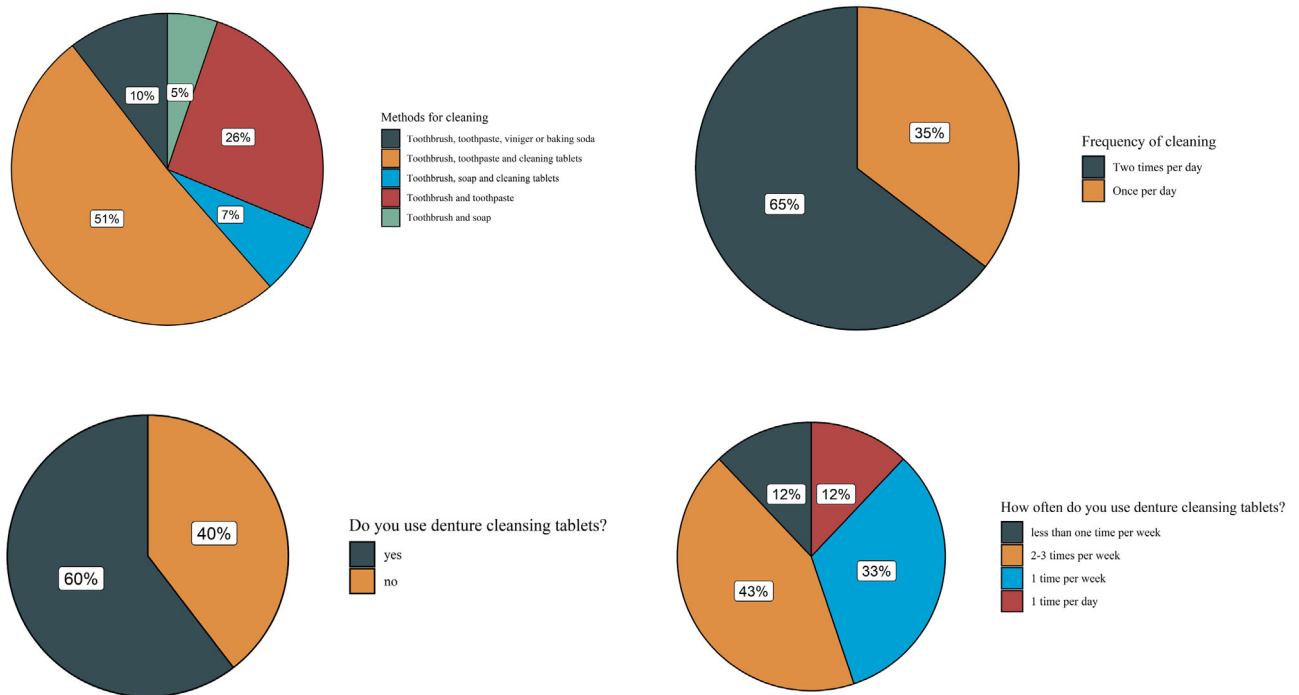
RESULTS

Ninety-six completely edentulous patients were included in the survey. The female participants (56.25%) were slightly more than the males (43.75%) but without a significant difference in proportion ($\chi_{\text{gof}}=1.50$, $p=0.221$). The age of the respondents follows a normal distribution with a mean of 68.06 ± 7.66 years (Fig. 2). The youngest participant was 49, whereas the oldest one - 88 years old. A cut-off of 65 years was used to categorize respondents into two groups – (1) old, constituting more than two-thirds of the sample at 71.88% and (2) young – 28.12 %, who were below the age of retirement. There was an even distribution of age across sexes ($t=1.432$, $p=0.156$).

Different methods and oral hygiene products were used by the respondents. Toothbrush, toothpaste, and cleaning tablets were used by 51.04% of the respondents. Toothbrush and toothpaste were used by 26.04%. In 10.42% of the sample, the latter is combined with vinegar or baking soda. Only 7.29% use the combination be-

tween brushing and soap with cleansing tablets, and 5.21% use toothbrush with soap. These answers suggest that only 12.5% use a non-abrasive cleaning method – a combination between toothbrush and soap. Nearly two-thirds of the respondents (60.42%) use denture cleansing tablets (Fig. 3).

Fig. 3. Cleaning methods and frequencies

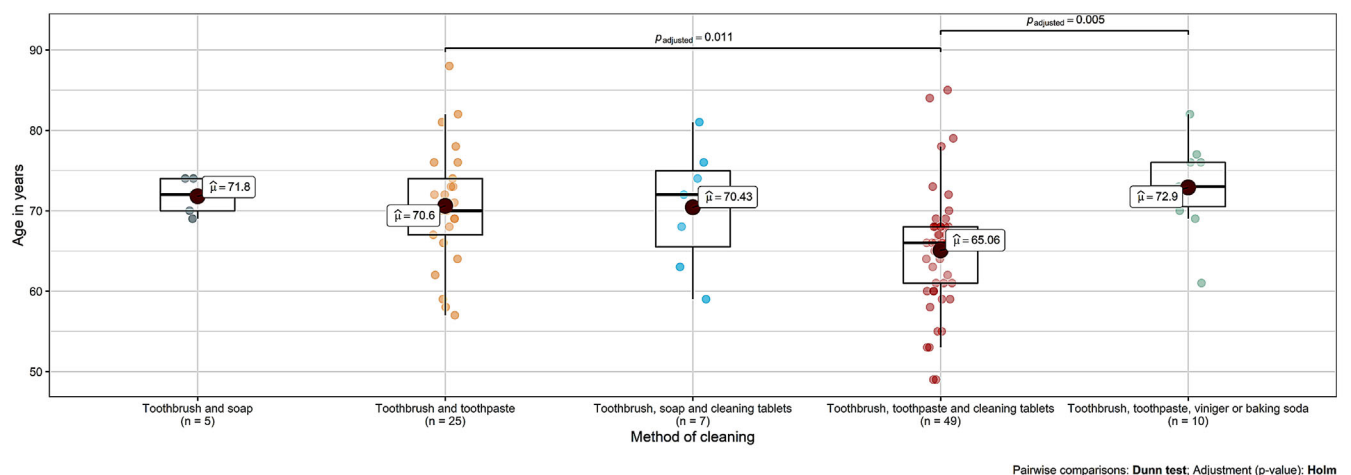


Besides the cleaning method, frequency of cleaning and cleansing tablets use are important for assessing proper hygiene habits in complete denture wearers. The findings in the current study show that 35.42% of the patients clean their dentures only once per day, whereas 64.58% clean them two times per day. Denture cleansing tablets are used by the participants daily in 12.07% of the cases. Twenty-five of the respondents – 43.10%, use tablets 2-3 times per week and al-

most one-third – 32.76%, one time per week. Less frequent use of this cleaning method was reported by 12.07% of the participants (Fig. 3).

A Kruskal-Wallis test evidenced a significant difference in the participants' age toward their preferred cleaning method [$\chi^2_{\text{Kruskal-Wallis}}(4)=22,12, p<0.001$]. Dunn's test for pairwise comparisons with the Holm adjustment method showed a significant difference between three of the groups – Fig. 4.

Fig. 4. Preferences for denture cleaning methods in relation to age.



An association between the variables age and use of cleaning tablets was found [$\chi^2(1)= 5.7984, p<0.05$]. Participants below the age of 65 tend to use this hygiene method more frequently.

Fig. 5. Association between age and use of denture cleansing tablets.

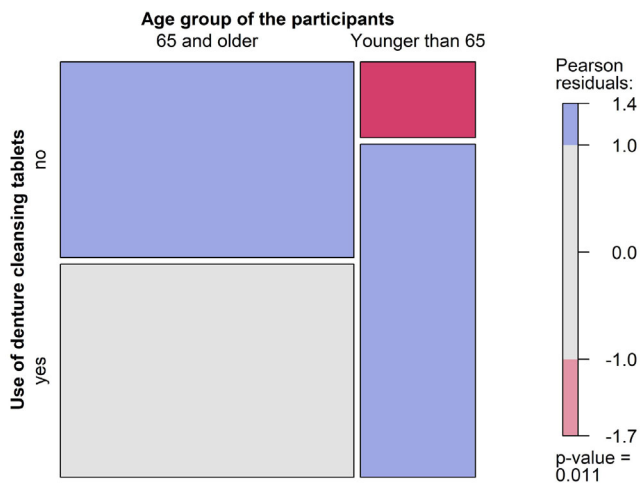
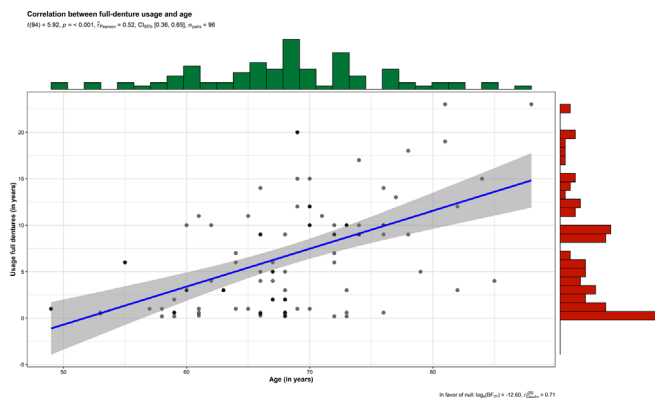


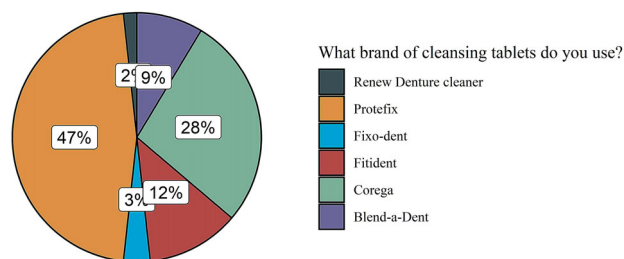
Fig. 6. Correlation between age and period of denture use.



Another association found within the studied sample was the positive relationship between age and the period of dentures usage. The Pearson test showed a strong positive correlation between the tested variables [$t= 5.92, p<0.001, r=0.52$].

The question about the brand of the used cleaning tablets showed that 47% of the patients prefer Protefix cleaning tablets, 28% use Corega cleaning tablets, and the other 25% of the participants use other brands – 12% Fitident, 9% Blend-a-dent, 3% Fixodent and just 2% Renew denture cleaner cleaning tablets. (Fig. 7).

Fig. 7. Brands of the cleaning tablets used by the patients



DISCUSSION

The questionnaire is the preferred research method about oral hygiene habits of the denture wearers [18, 19, 22]. A close-ended questionnaire was used by Takamiya [22], and we preferred the open-ended answers.

Proper rehabilitation with complete dentures requires adequate maintenance of the prostheses, i.e., correct storing, cleaning, and regular dental appointments. Hygienic neglect may adversely affect overall health and has been associated with increased bacterial-fungal colonization and the presence of opportunistic microorganisms [19, 21]. Several studies report that dentists give insufficient information or do not emphasize the importance of proper denture care. [3, 12, 19].

Biofilm attached to complete dentures can be removed either by mechanical or chemical methods. The most widespread method for prostheses cleaning is brushing with conventional and specific dentifrices [21]. Chemical cleansing was found by some researchers to be superior to brushing alone for denture plaque control [2, 9] and treatment of prosthesis-related stomatitis [18]. In contrast, another study suggested that brushing is better than the chemical method of removing denture plaque [16]. Chemical denture cleaning products could be an important alternative to mechanical cleaning, especially for elderly patients and for those who lack manual dexterity [7].

All the participants (100%) in the current study reported that they use brushing as a cleaning method, which is in accordance with other reported findings. Most of them - 86%, used toothpaste or a combination of toothpaste and other dentifrices. These results differ significantly from other studies reported by Òakamiva AS et al. I, who found that only 46.87% of the participants in their sample used toothpaste. [22] Other studies published by Hadzipaziz-Nazdrajiz et al. I and Szalewski, L et al. reported very similar findings at 86% and 90.9%, respectively. The latter are conducted in a setting and geographical region closer to our study sample, which may explain the similarity. [14,18]

Our data partially confirms the lack of association between denture hygiene and the socio-demographic factors reported in the study conducted by Al- Kaisy N et al. [4]. The only dependency found was between age and the use of denture cleansing tablets. It is established that the incidence of edentulism increases with age [4]; hence the positive relationship between the time of denture usage and

age in our sample was expected.

The use of different brands of cleaning tablets by the investigated patients does not correspond to Schalewski's research where the patients use only Corega cleaning tabs.[19] The number of patients using the cleaning tablets as a hygiene method is similar - 12% in our research and 8 % in Schalewski's research. Yankova's research concluded Protefix tablets are with better cleaning effect.[14]

The results of the research showed that the patients in Bulgaria are not well informed about the dentures hygiene and how to improve it. Wherefore after the results of the research, we made an instructions list about the dentures hygiene and the complete specifications about the use of the dentures use (Fig. 8). This instructions list now is given to each new patient after finishing the complete dentures treatment.

Fig. 8. Instructions list

Instructions for the patients using new removable complete dentures:

1. If you have speaking problems, read loudly 3 days in a row, 1 hour per day at home. This way, your tongue will get used to the new situation in your mouth, and the articulation of the sounds will improve.
2. Start with eating soft food (soups, salads). Do it for 3-4 days. After that, move on to food made out of minced meat or dairy products (cheese or yellow cheese). Do it for 3-4 more days. About the 10th day after the application of the dentures, you can start eating hard food.
3. Clean the dentures morning and evening with a brush and soap, do not use toothpaste or baking soda. Once a week, put the dentures in a glass with water in which is a dissolved tablet for the denture's cleansing. The denture has to stay in this solution for at least 3 hours.
4. Try to sleep with your dentures. If you can't do it, keep the dentures in a glass with water for the night. If you sleep with them, it is obligatory to skip one night per week. This will be the night when your gums and themucous membrane will rest from the foreign body in your mouth.
5. Pain is normally occur with the application of dentures, especially during meals. Don't worry! Just come to us for the correction! It is normal to have at least 3 corrections in 10 days.
6. Additional visit to the dentist is obligatory between the 14th and 21st day of application, even if you do not feel any pain. During this visit will be adjusted the contact points of the dentures and you will start feeling much more comfortable with them.
7. Use denture adhesive. It serves as a shock absorber between your dentures and your gum, reduces the risk of pain, increases the feeling of comfort and security, also improves the chewing function.
8. Sick candies, preferably mint ones, will help the faster adaptation to the dentures.
9. Do not use any ointment or medication to treat the wounds on the gums, if you get any. Only correction of the dentures could heal them.

CONCLUSION

Within the limitations of this study, it can be concluded that patients wearing complete prostheses had limited knowledge of denture cleaning and oral hygiene. Completely edentulous patients need improved guidelines regarding denture use and hygiene.

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