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ORIGINAL ARTICLE

KNOWLEDGE AND PRACTICES OF HYGIENE AND PRESERVATION OF DENTAL PROSTHESES IN PATIENTS OF THE DENTAL CLINICS OF A DENTISTRY SCHOOL IN THE CITY OF CALI - 2023

TÉCNICAS DE HIGIENE Y DE PRESERVACIÓN DE PRÓTESIS DENTALES EN PACIENTES EDÉNTULOS TOTALES Y EDÉNTULOS

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ABSTRACT

Introduction: 31.62% of the Colombian population uses some type of dental prosthesis. The use of a dental prosthesis requires periodic control by the dentist and daily care of the patients to maintain oral health and prolong the useful life of the prostheses. Oral hygiene should incorporate dental prosthesis care and storage practices, cause these ones are a very common treatment option; Deficiencies in hygiene and storage (preservation) of dental prostheses can affect oral tissues, teeth, and deteriorate prosthetic materials.
Objective: Determine the knowledge and practices of hygiene and storage of oral prostheses in 38 adult patients who attend the dental clinics of a university institution in Cali-2023.
Materials and Methods: Cross-sectional descriptive observational study where the data were obtained by a survey completed by the patients. The subjects and variables of age, sex, level of education, socioeconomic strata as demographic characteristics was described. Other variables were also evaluated such as use of prostheses, cleaning, hygiene, changes in fabrics, knowledge of cleaning products, implements, a database was created with information on the variables of interest initially, in the exploratory data analysis. identifying the existence of extreme values that could affect the estimates and verifying the variables; Data is collected through a survey, collection of results in data tables, categorization of the data obtained, and identification of measures of central tendency and its dispersion, the percentage of missing values, output tables of related frequencies will be generated with the variables. Comparison of the distributions of the characteristics of interest between those who underwent intervention and those who didn´t, using chi-square statistical tests, Fisher's exact test, and the variables measured on continuous scales such as age in the ANOVA t test, for comparison of means, be Bonferroni in the case of homogeneous or Tamahane variances, when they are heterogeneous.
Results: All patients stated that they cleaned their prostheses daily to ensure the hygiene of their prosthesis and 90% of them considered that the cleaning procedures were easy to perform using 16 combinations of products on the market, half of the respondents never removed their prosthesis for sleeping and in reference to knowledge of exclusive products for cleaning dental prostheses, the survey revealed that the majority are unaware of them.
Conclusions: Although all patients with prostheses stated that they cleaned them daily, only 63% were instructed by their dentist on how to do that properly and nine subjects 24% recognized the optimal products available in the market to do that.

CLINICAL RELEVANCE

Most patients who use prostheses lack adequate information for proper hygiene and storage of their prostheses and few use the specialized products on the market.

INTRODUCTION

Partial or total edentulism is a condition with multifactorial etiology that causes an impact on the quality of life of individuals. The treatment of edentulism by means of prostheses seeks to recover mastication, solve phonetic and esthetic problems among others.[1,2,3] Dental prostheses are commonly manufactured in acrylic (polymethylmethacrylate) metal alloys chrome-cobalt or nylon-based thermoplastic resins; prosthetic teeth are made with

acrylic, resin or ceramic and it should be clear that dental biofilms grow on natural teeth or on prostheses;[4] Therefore, it is recommended to clean the prosthesis daily and to sanitize the total or removable prosthesis with cleaning tablets and water, which significantly reduces the microbial counts.[4] Nitschke, I., Wendland state that dentures can serve as a reservoir for respiratory pathogens.[5] In some resource-poor populations, prosthesis wearers clean their prostheses with brushes and hand-washing and/or dishwashing soap, but these may not have the equivalent antimicrobial properties of professional chemical agents,[9] prosthesis sanitizers consist of effervescent tablets with oxidants such as sodium bicarbonate, sodium percarbonate and sodium persulfate, which release carbon dioxide bubbles when dissociated in water; while mouth rinses contain antimicrobials such as 0.2% chlorhexidine gluconate, 0.05% salicylate solution (a derivative of salicylic acid), and rinses with phenols or alcohols, but the antimicrobial properties vary widely.[9]

Dakka, A., Nazir, ZShamim, H. describe little education in oral health and prosthetic cleaning and care,[10,11] and according to Rocha, M. M., Carvalho, A. M., poor prosthetic hygiene increases the risk of pneumonia.[12] Sodium hypochlorite solutions at 1 %, 0.5 % and 0.25 % have been effective in removing biofilm from prostheses; however, deleterious effects on acrylic resin-based prostheses have also been reported after applying hypochlorite.[12,13] Another deleterious effect on the prosthesis is generated when the prosthesis is brushed with toothpastes containing silica-type abrasives that cause scratches on the prosthesis and possibly hinder cleaning.[14] Therefore, this study aims to determine the practices and knowledge of patients about the care, hygiene and storage of dental prostheses in a dental clinic of a dental school in Cali - 2023.

MATERIALS AND METHODS

Study design

Descriptive observational cross-sectional cross-sectional study among patients wearing removable or total prostheses and attending the postgraduate and undergraduate clinics of the School of Dentistry in 2023. The study was approved by the ethics committee of the faculty of health, participation was voluntary and those who accepted filled out the survey in google forms available in the attached link. Photographs were taken of the prostheses, protecting the identity of the patients.

Inclusion Criteria

Patients over 18 years of age, with a minimum use of a removable prosthesis in upper or lower arch (either total or partial prosthesis) who attended the dental clinics of the dental school of an educational institution in the city of Cali in the period 2023.

Exclusion criteria

Not currently wearing prostheses or being participants with cognitive disabilities or communication difficulties.

Table 1. Sociodemographic data of the population studied.

Sociodemographic	**Variables**			**x̄**	**DT**
	Quantitative	**Age in years**		66,05	7.67
	Variables			n	%
	Qualitative	Clinical	Undergraduate	32	84,2%
			Postgraduate	6	15,8%
		Gender	Female	24	36,8%
			Male	14	63,2%
		Social Stratum	1	16	42,11%
			2	6	15,79%
			3	15	39,47%
			4	0	0%
			5	1	2,63%
			6	0	0%
		Educational level	None	3	7,89%
			Primary school	11	28,95%
			Incomplete elementary school	3	7,89%
			High school	12	31,58%

			Incomplete bachelor's degree	2	5,26%
			Technologist	1	2,63%
			Technician	2	5,26%
			College degree	2	5,26%
			Incomplete higher education	2	5,26%

Sample calculation

The sample size was calculated with a power of 80% and an alpha error of 0.05 revealing to require 106 patients. Given the period of execution of the study, it was determined to use a convenience sample of 41 but 3 patients were excluded because they did not complete all phases of the study as shown in Figure 1. Excel tables were organized with the information and descriptive statistics with averages and standard deviations were performed.

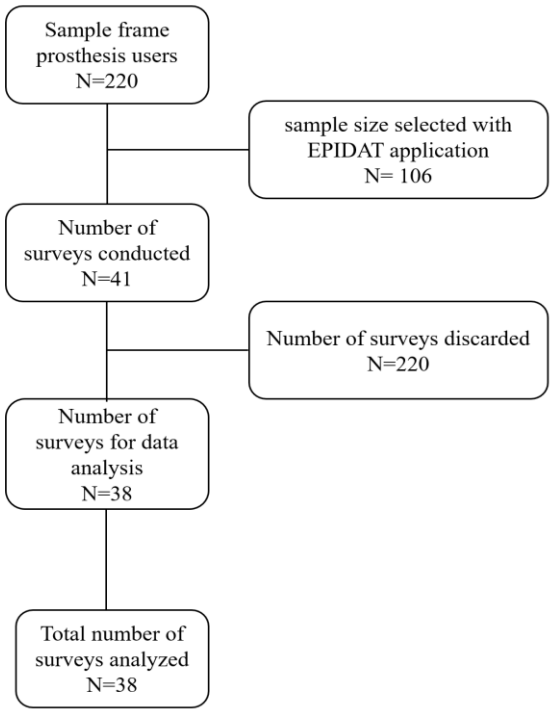

Figure 1. Flow chart of the study on knowledge, practices and storage of dental prostheses - 2023.

RESULTS

A total of 41 patients were surveyed,of which 38 patients were included and 3 were excluded because one participant did not sign the informed consent, and in the other two cases, photographs of the prostheses were not taken.

The sociodemographic characteristics of the population studied are described in Table 1. The age range of the prosthesis wearers was between 54 and 81 years with an average of 66.05 years and 84.2% of the participants were patients in the undergraduate clinics and the rest in the postgraduate clinics. There were 24 female participants being 63.2% and 14 males being 36.8%. The most frequent social stratum was 3 (39.47%) and the least frequent was stratum 5 (2.63%). With respect to educational level, the distribution was as follows from most frequent to least frequent: 12 participants with complete high school (31.58%), 11 participants with complete primary education (28.95%), 3 participants with incomplete primary education (7.89%), 3 participants with no educational level (7.89%), 2 participants with incomplete high school (5.26%), 2 participants with complete technical (5.26%), 2 participants with complete higher education (5.26%), 2 participants with incomplete higher education (5.26%) and 1 participant with complete technological level (2.63%).

According to the types of prosthesis used by the patients, the most frequent were: In upper arch transitional partial denture (16 participants) and total prosthesis (15 participants), followed by definitive removable partial denture (6 participants). Only one participant (2.63%) did not wear an upper denture. In the lower arch the participants tended not to use prosthesis (25 participants), followed by total prosthesis (5 participants), transitional partial denture (6 participants) and definitive removable partial denture (2 participants).

According to the time they had been using the prosthesis, the longest time of use was 20 years for 3 patients, the shortest time of use is 8 to 4 years, other participants reported having changed their prosthesis a few months ago.

Table 2. Knowledge of cleaning and storage practices of dental prostheses in edentulous and partially edentulous patients.

Variable	Category	n	%
Do you perform or not, hygiene to your prosthesis?	Yes	38	100%
	No	0	
Do you clean the prosthesis	yourself	38	100%
	Do not do it	0	
	Someone else for you	0	
Was it easy and comfortable for you to clean the prosthesis?	Yes	34	89%

	No	4	10%
Did you notice any changes in your teeth, mucosa, palate, tongue or gums? Did you notice any changes?	No	22	58%
	Qualitative Variables		
	Inflammation of gum	3	7,8%
	Dryness	2	5%
	Pain	1	2.6%
	Subprosthetic stomatitis	2	5%
	Bite	1	2.6%
	Tooth movement	3	7,8%
	discomfort in palate	2	5%
	sensitivity and irritation	1	2.6%
	Unilateral chewing after prosthesis	1	2.6%
Do you remove your prosthesis when you go to sleep?	yes	19	50%
	No	19	50%
Do you know hygiene products (toothpastes, rinses, etc.) that provide protection and cleaning for the prosthesis?	No know	29	76%
	yes	9	24%
What implements do you use in your oral hygiene?	Brush + cream	15	39%
	Toothbrush + antibacterial soap	5	13%
	Toothbrush + cream + rinse	4	10%
	Brush + cream + antibacterial soap	2	5%
	Brush + cream + chlorine	1	2.6%
	Brush + cream + effervescent tablets	1	2.6%

	Brush + cream + hydrogen peroxide	1	2.6%
	Chlorine + bicarbonate + water	1	2.6%
	Toothbrush + Baking Soda	1	2.6%
	Toothbrush + water	1	2.6%
	Toothpaste + mouthwash	1	2.6%
	Toothpaste + effervescent tablets	1	2.6%
	Chlorine + bicarbonate	1	2.6%
	Chlorine + antibacterial soap	1	2.6%
	Baking soda + antibacterial soap	1	2.6%
	Water + effervescent tablets	1	2.6%
Where in your home do you store your dentures?	Glass of water	14	36,6%
	The prosthesis is never removed	10	26,3%
	Plastic box	9	23,7%
	Towel or napkin	4	10,5%
	Under the pillow	1	2, 6%

In 63.6% of the cases, the treating dentist explained how the prosthesis should be cleaned and stored, while 36.4% did not receive any professional information about the care, cleaning or storage of the prostheses. Although 100% of the patients perform prosthesis hygiene autonomously and do not receive help; 9.1% of the participants find it difficult to perform prosthesis hygiene. Half of the patients who use prostheses report that redness is generated in the mucous membranes below the contact areas of the prostheses and that mucosal erosions related to excessive pressure are frequent.

Table 3. Hygiene products used for cleaning dental prostheses in the dental clinics of a dental school in the city of Cali 2023.

Products used for denture hygiene	n	%
Toothbrush	31	36,5%
Toothpaste	26	30,6%
Antibacterial soap	9	10,6%
Mouthwash	5	5,9%
Bicarbonate	4	4,7%
Chlorine	4	4,7%
Effervescent tablets	3	3,5%
Water + other implement (no toothpaste)	2	2,4%
Peroxide water	1	1,2%

In the survey on knowledge about the products used to clean their prostheses, only 22% of the participants knew about special hygiene products for prostheses.

The implements used for prosthesis hygiene are represented in 35% by the toothbrush as the most used product, which suggests that most patients perform mechanical cleaning of their prosthesis accompanied by chemical cleaning with products such as toothpaste (30.6%), antibacterial soap (10.6%) and mouthwash (5.9%). Other products used less frequently for cleaning are bicarbonate (4.7%), bleach (4.7%), effervescent tablets (3.5%), water without toothpaste (2.4%) and hydrogen peroxide (1.2%); Figure 2.

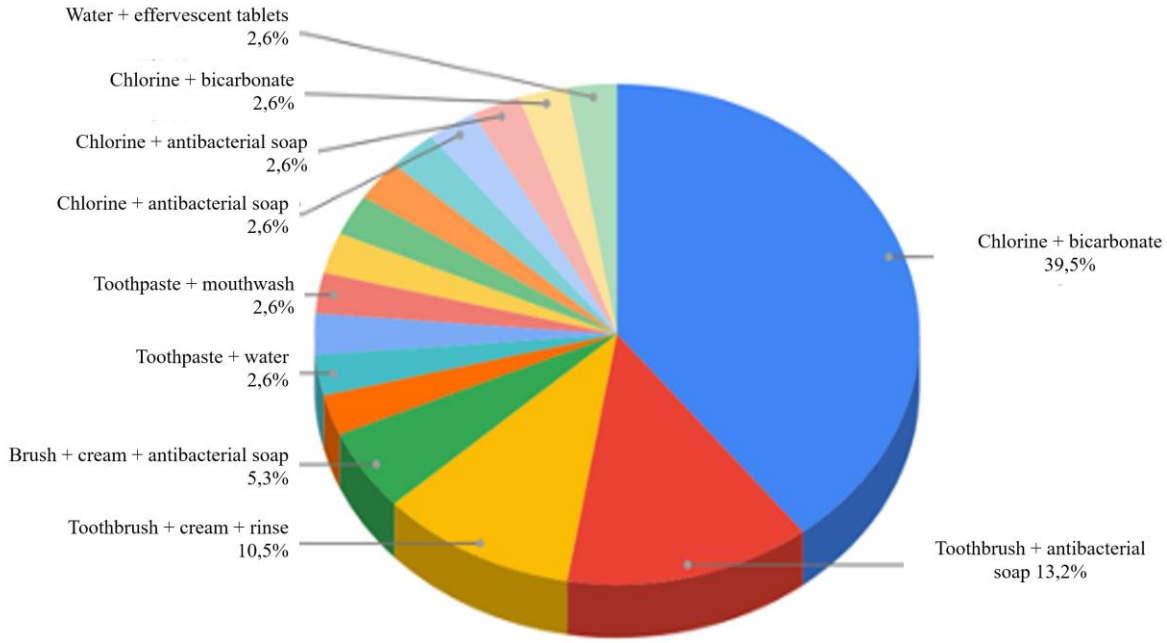

Figure 2. Products used for the hygiene of dental prostheses.

Regarding the storage of the prosthesis, 36.6% of the patients submerge their prosthesis in a glass of water when they are not using it, followed by 26.3% who do not remove the prosthesis at any time and, therefore, do not refer to a storage place. 23.7% store the prosthesis in a plastic box, 10.5% store it in a napkin or towel and 2.6% reported another storage place.

DISCUSSION

This study determined that the knowledge, hygiene practices and storage behavior of the prostheses by the patients is very varied and there is no uniformity in any of these aspects, except that all of them clean them daily (Table 1). At least one third of the prosthesis hygiene practices seem to be related to their own experiences since 36% never received instructions from the treating dentist on how to clean or store their prosthesis. The hypothesis that a high percentage of patients clean their prosthesis with implements such as toothbrushes and toothpastes; and few use effervescent tablets is partially confirmed. In relation to storage, more than half of the patients sleep with the prostheses due to lack of knowledge. Those who remove them to sleep store them in glasses with water, napkins and one patient places them under his pillow for convenience and ease of finding them (Figure 1).

With regard to the knowledge of specific hygiene products for prostheses, many said they knew about them, but limited their use because of the cost and because they were not easily available; in fact, 3 patients used effervescent tablets for cleaning (Table 3).

The negative consequences that patients mostly related to the use of prostheses were inflammation, ulcers, dryness, increased tooth movement, and dental pain.

According to Kamal Shigli et al.,[4] it is recommended that dentists should educate patients on the care they should take when using definitive, transitional and total removable prostheses, how they should perform oral and prosthesis hygiene, how storage should be performed and what should be periodic controls in the adaptation and replacement of the prostheses. The information provided should be in accordance with the age, abilities and educational level of the patients.

The use of prostheses requires the development of new skills and abilities among patients for proper oral health care and where it is important to maintain a balance between verbal information and written instructions, but it is also important to verify in practice that patients follow the recommendations of the professional.

In the study conducted by Tunde Joshua Ogunrinde and collaborators [15] it was found that the most common cleaning method for removable dentures is the use of toothbrush and toothpaste with 53%, followed by the use of toothbrush and soap with 37.9%. Similar results were obtained in the present study, with toothbrush and toothpaste also being the most common method of cleaning the prosthesis (39%), followed by toothbrush with antibacterial soap (13%), This finding is similar to the result obtained by Peracini and collaborators [15] where 58% of people did not remove the prosthesis before sleeping, however, the result of this study is contrary to that [15] where more than 70% of people did not remove the prosthesis before sleeping.

CONCLUSIONS

Although all the patients with prostheses stated that they cleaned them daily, only 25 participants (65.8%) were educated by the dentists on how they should do it and only 9 participants (24%) know which products are available in the market to perform a correct prosthesis hygiene. The most used element to clean the prosthesis is the toothbrush with toothpaste and most of the patients do not remove their prosthesis to sleep.

LIMITATIONS OF THE STUDY

During recruitment, there were difficulties due to lack of participants, because most of the patients with these characteristics were waiting to receive their first partial, total or transitional removable prosthesis, and some of the participants did not attend the clinics frequently.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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