

THE PERCEPTIONS, ATTITUDES, AND PRACTICES OF EDENTULOUS PATIENTS REGARDING THE MAINTENANCE OF COMPLETE DENTURE PROSTHESES

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ABSTRACT

OBJECTIVES

To evaluate the perceptions, attitudes, and practices of edentulous patients regarding the maintenance and hygiene of complete denture prostheses.

METHODOLOGY

A Cross-sectional descriptive design was conducted at the Department of Prosthodontics, Islamic International Dental Hospital, from May to October 2023. The sample size of 200 edentulous patients was calculated to achieve a 90% confidence interval with a 5% margin of error. The data collection procedure followed a structured process to ensure that relevant and accurate information was gathered from the study participants. The questionnaire was divided into two main sections: Section 1, which collected demographic data (e.g., age, education level, and socioeconomic status), and Section 2, which included information about the number of years the patient had worn dentures and focused on the patient's perceptions of maintaining their complete denture prostheses. It also gathered information on their cleaning habits, the frequency of professional cleaning, and their source of information regarding denture care. Data analysis was performed using IBM SPSS Statistics 23 software.

RESULTS

Most patients self-clean their dentures daily, with the primary method of cleaning dentures at home being the use of soap and water. However, the percentage of professional cleaning was relatively low. There was a direct correlation between education level, income status and denture cleaning.

CONCLUSION

There are gaps in professional cleaning practices and patient education. While many participants engage in basic denture cleaning routines, the lack of consistent professional care and reliance on suboptimal cleaning methods underscore the need for targeted interventions to promote optimal denture hygiene.

KEYWORDS: Complete Denture, Denture Base, Denture Cleanser, Oral Hygiene, Patient Education

INTRODUCTION

Globally, the rate of edentulism has been estimated to be between 7% and 69%.¹ This percentage has been reported to increase due to population growth. This emphasises the fact that there will continue to be demand for complete denture prostheses and the need for their maintenance.² Edentulism, or the loss of all teeth in one or both jaws, is a major issue with oral health in the world.³ Complete edentulism is the lack of teeth in the oral cavity. Adequate dentition is critical for

overall health and enjoyment of life. Edentulism is a public health burden for older people that has a direct impact on primary care practice.^{3,4} By 2030, the number of edentulous adults aged 65 and older is expected to rise to 212 million, up from the current estimate of 158 million. In Pakistan, the most popular method for addressing edentulism is through complete denture therapy. Traditional full dentures are highly favoured due to their affordability, aesthetics, and ease of maintenance.⁵ The most commonly used denture material is heat-cure polymethylmethacrylate (PMMA),

which is porous, allowing it to have a high potential for accumulating bacteria and dental plaque.⁶ Therefore, complete denture prostheses require daily cleaning and occasional expert care to prevent oral issues associated with dentures, such as denture stomatitis, angular cheilitis, burning mouth syndrome, and superimposed infections.⁷ The oral health of completely edentulous patients plays a crucial role in shaping their quality of life, influencing everything from social connections and nutrition to their overall well-being and systemic health.^{2,8} Even though it is frequently not life-threatening, the development of oral biofilm on complete dentures has been linked to both denture stomatitis and more severe systemic illnesses, particularly in older individuals who are dependent on others for care. The risk of systemic health complications is concerning in older patients as their immune systems are already compromised, making them prone to infections originating from poor oral hygiene. The presence of bacteria and fungi on dentures can exacerbate chronic conditions such as diabetes and cardiovascular disease, underscoring the importance of proper denture care. It is also essential to recognise the psychosocial implications of wearing dentures. The appearance of a person's teeth has a significant impact on their self-esteem and social interactions. Denture wearers are more conscious of social interactions, and they may experience social withdrawal or discomfort due to concerns about the esthetics and functionality of their dentures. Similarly, oral lesions have been reported to be primarily prevented by maintaining good denture hygiene. *Candida* spp. and bacteria that can result in denture stomatitis can grow when food particles are present between the denture and the gingiva or the denture and the palate. These microbes could also act as reservoirs for widespread illnesses that affect the gastrointestinal and respiratory systems.² Patients need to keep their oral prostheses clean, regardless of the method they choose for cleaning. Daily maintenance of the denture helps keep bacterial growth to a minimum, removes stains, and eliminates bad odours.⁹ For a complete denture prosthesis to last a long time, it is important to understand the aspects that influence its upkeep and maintenance. The complaints related to the upkeep and care of dentures have been taken into account in a few prior research on complete denture users.^{10,11} The lack of information in this area of dentistry allows for more study to be done in this field, which is crucial to understanding the elements that influence the maintenance and care of CDP for both dental professionals (DPs) and elderly patients.¹² Patient education plays a vital role in ensuring that patients follow correct denture hygiene protocols. The majority of the patients lack basic knowledge about proper denture maintenance or the potential health risks

associated with poor hygiene practices. The maintenance of complete denture prostheses plays a crucial role in the overall oral health and well-being of edentulous patients. Therefore, the rationale of this research is to explore how edentulous patients perceive and manage their denture care. The insights gained will be valuable in designing patient-centred educational programs and interventions that promote better hygiene practices and improve long-term oral health outcomes. The study aims to evaluate the attitudes, beliefs, and practices of edentulous patients regarding the maintenance of complete denture prostheses.

METHODOLOGY

This study employed a quantitative research design to assess patients' perceptions of prosthesis maintenance from May 2023 to October 2023 at the Department of Prosthodontics, Islamic International Dental Hospital, Riphah International University, Islamabad. The inclusion criteria comprise the patient must be fully edentulous, meaning they have no remaining natural teeth, and they must have been using complete dentures for at least six months, ensuring they have sufficient experience with the dentures. Exclusion Criteria included Individuals with cognitive impairments (e.g., dementia) are excluded to avoid complications in understanding or responding to study-related tasks. Patients who struggle to communicate effectively, whether due to language barriers, hearing loss, or other conditions, are excluded to ensure clear interaction and data collection. Any patient who is unwilling to participate in the study is excluded, as informed consent is essential for participation. This ensures that the study population consists of patients who are capable of understanding and contributing to the research while maintaining uniformity in the patient characteristics. The sample size was calculated to achieve a 90% confidence interval with a 5% margin of error.

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

The sample size was calculated using the formula mentioned above. Convenience sampling was employed to find participants for the study. The data collection procedure followed a structured process to ensure that relevant and accurate information was gathered from the study participants: The researcher approached

patients who met the inclusion criteria and provided a clear explanation of the study's objectives and methods. This was done in the waiting area to ensure the process was efficient and convenient for the patients. Interested patients were given a consent form and an information sheet, which they could read to understand the nature of the study fully. After reviewing the information, patients who agreed to participate signed the consent form, affirming their willingness to take part in the survey. Once consent was obtained, participants were given a questionnaire to complete. The questionnaire was divided into two main sections: Section 1, which collected demographic data (e.g., age, education level, and socioeconomic status), and Section 2, which included information about the number of years the patient had worn dentures and focused on the patient's perceptions of maintaining their complete denture prostheses. It also gathered information on their cleaning habits, the frequency of professional cleaning, and their source of information regarding denture care. This procedure ensured that the study gathered both demographic data and valuable insights into patient habits and perceptions concerning their denture care, which would aid in the study's analysis. The study was carried out in compliance with the Ethics Committee of Islamic International Dental Hospital, Riphah International University, Islamabad. ERC Reference No. IIDC/IRC/2023/04/023. The participants provided informed consent for the study before completing the questionnaire. They gave their consent voluntarily and were informed that they could withdraw from the study at any stage. Data analysis was performed using IBM SPSS Statistics 23 software. Descriptive statistics were first applied to summarise the demographic characteristics of the participants and their responses to the questionnaire. This provided an overview of key variables, including age, education level, and duration of denture usage. Inferential statistics, specifically chi-square tests, were then used to assess potential associations between demographic factors and patients' attitudes toward maintaining their full denture prostheses. These statistical methods helped determine whether significant relationships existed between the variables and allowed for a deeper understanding of the factors influencing denture care practices.

RESULTS

A total of 200 edentulous patients participated in the study. Males made up the majority of the patients, at 58.5%, while females accounted for 41.5%. The educational background of the patients was mainly primary school education (49%), 31% had secondary school education, and only 20% had university education or advanced education. Patients were divided into three age groups: those under 40 years, which

made up 22% of the patients; the majority of patients were in the age group between 40 and 60 years, and 21% were above the age of 60. The annual income varied between more than 600,000 and less than 300,000. 49.5% of patients made more than Rs 600,000. In contrast, 17.5% made less than 300,000/-. The edentulous patients were classified into four groups based on the number of years they had been wearing dentures. Most of the patients had been wearing dentures for less than 5 years 43%. In other years, 24.5% of patients had more than 10 years of experience, 18% of patients had been wearing a prosthesis for less than 10 years, and only 14.5% of patients had worn a prosthesis for less than a year. The results of our study showed that only 33.5% of participants cleaned their dentures once a day, while 18% cleaned them twice a day. However, 48.5% of patients cleaned their dentures less than once a day. The cleaning solutions used were mainly soap and water (63.5%) and denture cleansers (36.5%). The majority of patients received information about denture maintenance from their dentist (48.5%), while others obtained it from the Internet (26.5%). And a few got tips from friends and family, 25%. When asked about professional denture cleaning, 65.5% of patients reported that they had never had their dentures professionally cleaned. About 23.5% had it cleaned once a year, while 11% had professional cleaning done twice or more in the last year. In Statistical Analysis, Chi-square tests revealed significant associations between denture cleaning frequency and the variables of age ($p < 0.05$), gender ($p < 0.05$), education level ($p < 0.01$), and annual income ($p < 0.01$). Participants with higher income and education levels were significantly more likely to clean their dentures regularly and to utilise professional cleaning services. Female participants demonstrated significantly better denture hygiene practices compared to males ($p < 0.05$). Additionally, older patients, particularly those wearing dentures for over 10 years, showed greater compliance with denture maintenance routines than younger age groups ($p < 0.05$).

Table 1: Demographic Characteristics of Study Participants

Demographic Characteristics	Number	%age
Gender		
Female	83	41.5%
Male	117	58.5%
Education level		
Primary education	98	49%
Secondary education	62	31%
Advanced education	40	20%
Mean age		52.39
Annual income		
Less than 300,000/-	35	17.5%
Between 300,000- 600,000/-	66	33%
More than 600,000/-	99	49.5%

Table 2: Denture Maintenance Practices of Study Participants

Denture maintenance Practices	Number	%age
Frequency of cleansing		
Once a day	67	33.5%
Twice a day	36	18%
Less than once a day	97	48.5%
Type of cleansing agent		
Denture cleansing tablets or solutions	73	36.5%
Other cleansing agents (soap and water)	127	63.5%
Frequency of professional cleansing		
Never	131	65.5%
Once a year	47	23.5%
Twice a year	22	11%
Source of information on denture maintenance		
Dentist	97	48.5%
Friends/family	50	25%
Others (Internet, brochures)	53	26.5%

DISCUSSION

The purpose of the study was to evaluate how edentulous patients felt about maintaining a complete denture prosthesis. In comparison to our study, where only 33.5% of participants cleaned their dentures once daily, and 18% cleaned them twice daily, the 2024 study from Brazil, involving 140 participants, reported a higher proportion (58.6%) performing once-daily cleaning, but a lower percentage (8.6%) practising twice-daily cleaning. While our study found that 48.5% of individuals cleaned their dentures less than once a day, indicating a significant lapse in oral hygiene, the Brazilian research also assessed overall oral care, noting that 36.4% of participants cleaned both their dentures and natural teeth regularly.¹¹ This preference for non-commercial agents aligns with findings from a 2024 multicenter study, where 19.4% of participants used a combination of water and soap, and 13.4% used a toothbrush with soap. In contrast, only 2.3% utilised denture cleansing tablets.¹¹ Similarly, a 2017 study in India reported that 28.8% of participants used denture cleansing tablets, while 15.9% used plain water. Interestingly, 34.1% employed a combination of brushing and soaking techniques.¹⁰ In our study, 65.5% of participants reported never having their dentures professionally cleaned, while 23.5% had them cleaned once a year, and 11% had them cleaned twice a year. This highlights a significant reliance on self-maintenance among denture wearers. A similar pattern was observed in a study conducted in Nigeria, where 59% of participants did not have regular dental check-ups, and only 3.2% had check-ups once a year. This suggests that a substantial portion of denture wearers may not be receiving professional care regularly.¹³ In contrast, a study in Central Transylvania, Romania, reported that 54.3% of respondents cleaned their dentures 2-3 times a day, and 40.1% cleaned them once a day. While this study focused on cleaning frequency

rather than professional care, it indicates a higher level of personal hygiene practices among participants.¹⁴ These comparisons underscore the variability in professional denture cleaning frequencies across different populations, highlighting the need for increased awareness and access to professional dental care for denture wearers. In our study, 48.5% of participants reported obtaining information on denture maintenance from their dentist, 25% from friends or family, and 26.5% from other sources such as the Internet or brochures. This pattern aligns with findings from a study conducted in Karad, Maharashtra, India, where 29.6% of participants received denture hygiene and maintenance instructions from their treating dentists. Similarly, a study in Jabalpur City, Madhya Pradesh, India, found that 52.8% of participants reported cleaning their oral tissues daily, indicating a reliance on professional guidance for oral hygiene practices. These findings are consistent with a 2024 multicenter study conducted in Yemen, which reported that 59.4% of participants obtained denture care information from their dentists, while 18.9% relied on friends or relatives, and only 5.5% sourced information from the Internet. Similarly, a 2023 study in Athens, Greece, found that approximately 50% of older adults received oral hygiene information from their dentist, with additional sources including media, friends, and non-dental healthcare providers.^{15,16} The perception and practice of denture care depend on one of the most important themes: social and cultural factors. Cultural beliefs and practices significantly influence denture care, often leading to inadequate maintenance due to stigma and traditional hygiene methods. In various societies, the use of dentures can carry a stigma, affecting individuals' willingness to seek professional help or discuss denture hygiene. For instance, among tribal communities in Tamil Nadu, India, many individuals use twigs or their fingers for cleaning, with a significant portion not brushing their teeth daily, reflecting traditional practices and limited access to modern dental care. Similarly, in Nigeria's Yoruba ethnic group, cultural beliefs and practices significantly impact oral health behaviours, with misconceptions and cultural myths hindering individuals from seeking professional dental care.²⁴ Economic and demographic considerations have a significant influence on denture care. Patients with low incomes often face financial constraints that prevent them from accessing competent dental treatment and high-quality denture cleaning solutions.³ These patients are more likely to opt for less expensive and less effective methods to clean their dentures, which may not eliminate biofilm or other forms of contamination. Several factors, including cost, accessibility, and a lack of awareness about the value of professional cleaning, may contribute to the absence of

professional cleaning.¹⁵ For example, in locations where dental clinics are scarce, particularly in rural areas, the distance and time required to see a dentist may be too long for many patients, especially the elderly or those with mobility concerns. Furthermore, the cost of professional denture cleaning might be a major deterrent. For individuals on fixed incomes or without dental insurance, the cost of routine dental checkups and professional cleanings may be considered unnecessary, resulting in rare or nonexistent professional care. A logistic regression study showed that age, education, and income level were significant predictors of professional cleaning. In contrast, older patients were less likely to have their dentures professionally cleaned because of accessibility and cost issues. Older patients, especially those living in rural areas, often have limited access to dental care facilities and are less likely to receive regular professional cleanings.¹⁶ However, our study revealed that older individuals who had been using dentures for more than 10 years were more proficient with denture cleaning compared to the younger age group. The same results as this study.¹⁷ This proficiency among older patients may be attributed to their long-term experience and adaptation to wearing dentures, which can lead to a better understanding of the necessary care practices. Additionally, these patients may have established routines that incorporate regular denture cleaning, thus making them more consistent in their maintenance habits. Education and income are crucial determinants of health behaviours, including oral hygiene practices. Individuals who have higher levels of education are more likely to understand the importance of oral health and the need for regular care and maintenance of their dental prostheses.¹⁶ They are also more likely to have access to authentic information sources that promote good oral hygiene practices. Higher-income levels enable patients to afford professional dental services, including routine cleanings and check-ups. This can help in the early detection and management of potential issues with dentures. Socioeconomic disparities have a significant impact on denture maintenance and oral health outcomes, necessitating targeted public health interventions. Studies have consistently shown that individuals with lower incomes and lower educational levels exhibit poorer oral hygiene practices and reduced access to dental care. For instance, research indicates that people without formal education are more likely to be edentulous and less likely to utilise dental services.¹⁴ The study by Baba et al. (2018) compared the effectiveness of mechanical and combination denture-cleaning methods in terms of denture cleanliness and patient satisfaction.²⁵ The difference lay in the cleaning process. Patients presenting in our department mainly used soap and water for hand hygiene. Patients in the

South Indian population mostly used water to clean their denture prostheses.¹⁸ In our study, the cleaning solutions used were mainly soap and water (63.5%) and denture cleansers (36.5%), while in India, the use of denture cleaning solutions was 25%, rinsing with water was 35%, using toothpaste was 30%, and detergents were used in only 10% of cases. Soap and water, while commonly used, may not be as effective as specialised denture cleaning solutions in removing microbial biofilms and stains. Denture cleaning tablets or solutions are specifically formulated to break down and remove debris, bacteria, and stains without damaging the denture material. However, the cost and availability of these products may influence patients' choices, with some opting for more accessible but potentially less effective methods, such as soap and water. The fact that most people prefer to use water as a primary cleaning agent for dentures might be due to a lack of access to specialised denture cleaning products. Using only water might not be a feasible solution, especially for people living in humid environments. It can contribute to faster bacterial growth on dentures, making denture cleaning even more difficult. Contrarily, participants with higher levels of education and income were more likely to have their dentures cleaned by a professional, suggesting that these variables may enhance access to dental care and awareness about denture maintenance.^{18,19} In our study, we found that 18% of denture wearers clean their dentures twice a day, compared with a survey in Bulgaria, where 65% of patients reported cleaning their dentures.¹⁵ This highlights the fact that we need to educate our patients about proper denture maintenance and the possible adverse effects associated with improperly maintained dentures. One of the primary adverse effects of inadequate denture hygiene is the development of oral infections, which result from the formation of biofilm on the inner surface of the complete denture. We should emphasise the importance of periodic consultations with the dentist, evaluation of the prosthesis, reinforcing hygiene instructions and increasing adherence to hygiene practices.²⁰ The fact that the majority of participants had received information about denture care from their dentist or dental hygienist is encouraging, highlighting the importance of dentists educating patients about oral health.²¹ To reach patients who might not have access to regular dental appointments, it is necessary to look into alternative information sources.²² There is often a lack of targeted education for patients about the importance of regular professional denture cleaning. Without this knowledge, many patients may not understand the potential risks associated with inadequate denture care, including oral infections, discomfort, and a reduced lifespan of the prosthesis. These barriers highlight the need for more

accessible and affordable dental care services, as well as enhanced patient education to improve the overall maintenance of complete dentures. These could include the internet or pamphlets.²³ The study's findings offer insight into how edentulous individuals perceive the maintenance of complete denture prostheses. Effective communication and motivation between the patient and dentist are important factors for denture care and maintenance.^{8,21,23} Future research should aim to include a more diverse participant pool representing various ethnicities, regions, and income levels. This broader perspective will help identify unique challenges and practices related to denture care across different groups. Expanding the sample to include a variety of ethnic, socioeconomic, and geographical backgrounds will provide a more comprehensive understanding of denture maintenance. Future studies should focus on developing culturally sensitive educational materials that address the specific needs and practices of diverse groups, enhancing health literacy and overcoming cultural barriers to effective denture care. Tailored oral health programs and resources should be developed to promote effective denture care, ensuring they align with the unique cultural and socioeconomic contexts of the population. By incorporating these recommendations, future studies can enhance denture care practices and improve oral health outcomes for a more diverse range of denture wearers.

LIMITATIONS

The use of convenience sampling may have introduced selection bias. Participants were selected based on accessibility rather than randomisation, which limits the ability to generalise the findings to the wider population. The relatively small number of participants reduces the study's statistical power. This may limit the ability to detect subtle but potentially meaningful associations between variables. The reliance on self-reported information regarding denture hygiene practices introduces the possibility of recall bias and social desirability bias. Participants may have over- or underreported their actual behaviours, resulting in inaccuracies in the data. The study population may not fully represent the broader diversity of denture wearers in terms of cultural background, socioeconomic status, and geographic location. A more diverse and representative sample would allow for a more comprehensive understanding of how these factors influence denture care practices. Expanding the study to include a larger and more diverse population would enhance its relevance and provide deeper insights into the complex interplay between cultural beliefs, attitudes toward dental care, and denture maintenance behaviours.

CONCLUSIONS

This study emphasises the importance of expanding access to professional denture cleaning and instruction on denture maintenance, particularly for elderly individuals with lower income and educational backgrounds. As healthcare providers, we have to equip our patients with the information that can help them achieve the best possible oral health. By taking community-based initiatives and organising public health campaigns, we can play a fundamental role in raising awareness about the significance of regular denture care and professional cleaning. By addressing challenges such as accessibility, cost, and patient education, we can build a more equitable healthcare system that is necessary to support and guide patients in maintaining optimal denture hygiene. Further studies may reveal valuable approaches for enhancing denture upkeep in edentulous patients.

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The authors accept responsibility for all aspects of the work and will ensure that any concerns regarding the accuracy or integrity of any part are properly investigated and resolved.



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