

# Assessment Of Denture Hygiene Knowledge and Practices Among Complete Denture Wearers Reporting to a Tertiary Care Dental Hospital

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## ABSTRACT

**Objective:** To assess the denture hygiene knowledge and practices among complete denture wearers.

**Methods:** The study was conducted in Prosthodontics department, Foundation University College of Dentistry from August 2024 to January 2025. A total of 160 complete denture wearers were selected fulfilling the criteria using non-probability consecutive sampling technique. A self-administered questionnaire comprising of questions related to demographics, denture characteristics, and denture hygiene habits was distributed among complete denture wearers. Each question was scored and categorized to calculate the overall denture hygiene knowledge score of each patient. Data was entered and analysed in SPSS 21.

**Results:** A total of 160 patients were selected with a mean age of  $64.68 \pm 5.6$  years. Out of these, 79 (49.38%) were males and 81 (50.63%) were females. The score obtained by the study participants ranged from 9 to 27 with the mean denture hygiene knowledge and practices score of  $17.08 \pm 5.5$ . A significant association was found between level of education, denture duration and socioeconomic status with that of hygiene score (p value <0.001).

**Conclusion:** A large proportion of denture wearers were found to have poor hygiene practices and little knowledge regarding proper denture cleansing. A strong association among low socioeconomic status, rural setting, and deficient denture oral hygiene reinforces systematic obstacles to denture care like limited dental provision and financial insecurity.

**Keywords:** Complete Denture, Denture Hygiene, Edentulous, Knowledge, Practices

### Authors' Contribution:

<sup>1,2</sup>Conception; *Literature research; manuscript design and drafting;* <sup>2,3</sup>Critical analysis and manuscript review; <sup>5,6</sup>Data analysis; *Manuscript Editing.*

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## Introduction

Denture and oral hygiene maintenance is an important factor in the long-term success of any removable prosthesis such as complete or partial dentures. Dentures are prone to accumulate surface deposits due to inherent shortcomings of the base material.<sup>1</sup> This may lead to several adverse effects

such as foul smell, stomatitis, and mouth ulcers. Therefore, it is important to maintain oral and denture hygiene as part of routine homecare regime regularly.<sup>2</sup> In their study on denture hygiene habits in complete denture wearers, Dwivedi et al<sup>3</sup> found that almost 51% of individuals had knowledge about denture cleansing methods while only 40% of them

cleaned their dentures daily. All subjects were using either brushing or combination of different methods.<sup>3</sup> Another study conducted by Rahmayani et al<sup>4</sup> found the relationship of oral hygiene behaviour and its maintenance with gender, age and duration of denture usage. It was reported that 15% of the subjects were good in maintaining dental and oral hygiene, 76% were poor and 9% were not good.<sup>4</sup> Various studies have been done to assess denture hygiene habits in controlled sample populations, indicating the effect of cleaning habits and methods on general oral hygiene and the health of supporting tissues. A study by Camila B. et al<sup>1</sup> concluded that all hygiene protocols were effective in biofilm removal, microbial load decrease of *Candida Albicans* and gram-negative microorganisms.<sup>1</sup> A study by Valentini F et al<sup>2</sup> determined soaking complete dentures in 0.5% sodium hypochlorite (NaOCl) or 0.12% chlorhexidine gluconate solution for 10 minutes once a week and mechanical cleaning 3 times a day with a toothbrush effectively reduced microbial viability on complete dentures.<sup>2</sup> In a study by Petros Mylonas et al<sup>5</sup> on the importance of hygiene habits and methods under the guidelines of DCI (denture cleanliness index), the best suited methods and materials for denture hygiene and their compatibility to the denture base materials was discussed.<sup>5</sup> A study by Shankar et al<sup>6</sup> on denture hygiene knowledge and practices among complete denture wearers, it was found that more than half of the patients cleaned their dentures daily, while 10.2% reported that they had never been advised on how to clean their dentures.<sup>6</sup> Ghimire et al<sup>7</sup> assessed the denture hygiene habits among the old age denture wearers. They found that 57% subjects cleaned their dentures with water only and 35% cleaned it with brush and 7% used the combination of both. Most of the patients in their study cleaned their dentures at least once a day.<sup>7</sup> In the light of such conflicting results regarding denture hygiene maintenance, the present study was planned to assess the knowledge and hygiene habits of our local complete denture-wearing

population. It is hoped that this information will benefit the local dentists in adopting better/targeted denture hygiene instructions and follow-up care for the patients.

## Methodology

This was a cross-sectional study conducted in the Department of Prosthodontics at Foundation University College of Dentistry and Hospital, Foundation University Islamabad Pakistan from August 2024 to January 2025.

Both male and female patients wearing conventional complete dentures for at least 06 months and within the age of 40-80 years were included in the study. Patients were excluded if any one of the following conditions were present: debilitating systemic conditions (autoimmune diseases, metabolic disorders etc), Immunocompromised conditions, history of radiotherapy or chemotherapy within the past year, mental or physical handicap, excessively resorbed alveolar ridges, and expired dentures (visibly fractured/ damaged).

WHO calculator was used to calculate sample size with Absolute Precision 4.5%, Confidence Interval of 95%, Anticipated population proportion of 9%<sup>4</sup>, sample size 160. A non-probability consecutive sampling technique was used for sample collection. A written informed consent was obtained from each patient after explaining to them the entire data collection procedure and the time required for it.

Patients were seated on the dental unit and a face-to-face interview was conducted by the principal investigator using a validated questionnaire consisting of 09 close-ended questions regarding denture hygiene knowledge and practices being observed by the patient. Additionally basic demographic information was also obtained from each patient including age, gender, level of education, socioeconomic status, and residential status (urban or rural). Questions related to the following aspects were asked: Storage of denture

after removal, unhygienic dentures as a source of infection, frequency of denture cleaning daily, experiencing any bad smell/halitosis with dentures, duration of denture wear in a day, storage of denture wear before sleeping, information regarding denture cleansing instructions, replacement of old dentures, visit to the dentist for denture check-up. All complete dentures were assessed for their overall cleanliness by the principal investigator under supervision of a junior faculty member.

Each question carried three responses depending upon least favorable to most favorable choice. These were given a numerical value ranging from 1 to 3 which was used to calculate the total score of the patient regarding denture hygiene knowledge and practices. Total score ranged from 9-27 (9 being minimum and 27 being maximum). This total score was then used to categorize the denture hygiene knowledge and practices into 3 groups: 9-15 = poor hygiene, 16-21 = average hygiene, and 22-27 = good hygiene.

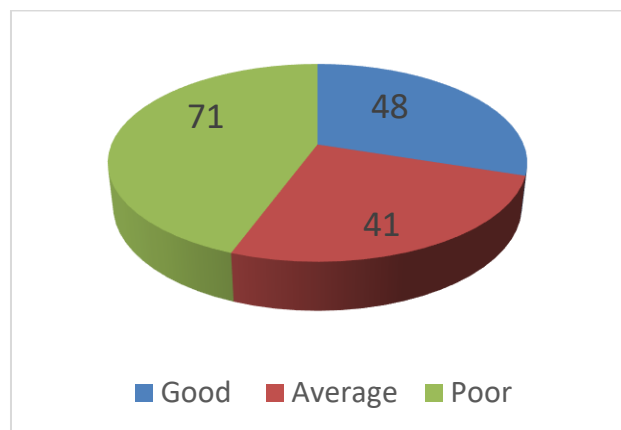
Statistical Package for the Social Sciences (SPSS) version 21 was used for analysis of the data. Descriptive statistics (median, frequencies and percentages) were calculated. Means were analyzed using Kruskal-wallis and Mann-Whitney U test to determine differences in hygiene score across different variables in the study. A p-value of less than 0.05 was considered statistically significant.

**Ethical approval** for the study was obtained from the institutional review board Foundation University, Islamabad, Foundation University College of Dentistry and Hospital (Ref# FF/FUCD/632/ERC/57) on 15-03-2023.

## Results

The number of patients was 160 with a mean age of  $64.68 \pm 5.6$  years. Out of these, 79 (49.38%) were males and 81 (50.63%) were females. A total of 105 (65.63%) had primary education, 30 (18.75%) had secondary education, 16 (10%) had higher

secondary education, 8 (5%) had a bachelor's degree and only 1 (0.63%) had a master's degree. A total 42 (26.25%) were using dentures which were < 3 years old, while 62 (38.75%) patients were using dentures which were 3 to 5 years old and 56 (35%) patients were using dentures which were > 5 years old. A total of 8 (5%) belonged to high socioeconomic status, 28 (17.5%) belonged to middle socioeconomic status and 124 (77.5%) belonged to low socioeconomic status. A total of 51 (31.88%) belonged to urban areas and 109 (68.13%) belonged to rural areas. The scores for denture hygiene knowledge and practices are given in Figure 1. Table-I shows the details of assessment of denture hygiene knowledge and practices by the patients. The score obtained by the study participants ranged from 9 to 27 with the mean denture hygiene knowledge and practices score of  $17.08 \pm 5.5$ .



**Figure 1: Denture hygiene knowledge and practices score among patients (N = 160)**

Kruskal-Wallis H test showed that there was a statistically significant difference. **Table-II** indicates that a significant association was found between level of education (p value = 0.001), denture duration (p value 0.001) and socioeconomic status (p value 0.001) and hygiene score. **Table-III** also indicates that there is a significant association between gender (p value = 0.003), education (p value = 0.001), residential area (p value 0.001) and hygiene score.

Sr.	Questions	Options	n	%
Q1	How do you store your denture after removal?	Leave it out in the open	63	39.375
		Wrap in a plastic bag	41	25.625
		Immerse in plain water	56	35
Q2	Are unhygienic dentures a source of infection?	Do not know	36	22.5
		No	74	46.25
		Yes	50	31.25
Q3	How frequently do you clean your denture daily?	Once	70	43.75
		Twice	42	26.25
		Thrice or more	48	30
Q4	Do you experience bad smell/halitosis with your dentures?	Yes	61	38.125
		Sometimes	50	31.25
		Never	49	30.625
Q5	How long do you wear your denture in a day?	Day and night	66	41.25
		Only during eating	48	30
		All day except night	46	28.75
Q6	How do you store your denture before sleeping?	Leave the denture out in air	69	43.125
		Wrap in plastic bag or cloth	45	28.125
		Immerse in plain water with denture cleaning tablets	46	28.75
Q7	How were you informed about denture cleansing instructions?	Do not remember	82	51.25
		Verbal	43	26.87
		Written	35	21.87
Q8	When do you have to replace your old dentures?	> 5 years	77	48.125
		3 years	34	21.25
		3-5 years	49	30.625
Q9	When did you last visit your dentist for your denture check-up?	> 1 year	61	38.125
		< 6 months	23	14.375
		6-12 months	76	47.5

Variables	Categories	Hygiene Score Median (IQR)	p – value (Kruskal-Wallis)
Education	Primary	18 (11)	.001
	Secondary	12.5 (5.75)	
	Higher Secondary	22 (5.25)	
	Bachelors	21 (6)	
	Masters	24 (0)	
Socioeconomic Status (SES)	High SES	21 (7.5)	< .001
	Middle SES	20.5 (8.25)	
	Low SES	12 (6)	
Denture Duration	<3 years	18 (9.75)	< .001
	3 to 5 years	16.5 (11)	
	>5 years	17 (11)	

Variables	Categories	Hygiene Score Median (IQR)	p – value (Mann-Whitney U test)
Gender	Male	15 (9.5)	.003
	Female	21 (11)	
Education	Intermediate and below	16.5 (9)	.001
	Bachelors and above	18 (12)	
Residential Status	Urban	18 (10.5)	< .001
	Rural	16 (11)	

## Discussion

The results of our study show that an overall poor denture hygiene practices and lack of knowledge regarding denture cleaning among a large number of our sample. The results of this study identified strong associations between denture cleanliness

and various demographic, denture, and behavioral characteristics. Most of the patients kept their dentures in an unhygienic manner, as 39.375% kept them out in the open, and merely 28.75% utilized appropriate cleansing techniques. These outcomes emphasize the necessity for better patient education and awareness concerning denture care. This was supported by numerous studies found in the literature regarding denture hygiene. In a study by Kanal B et al, who reported that 26.5% of patients did not remove their dentures at night while 12.1% kept their dentures out in the air and this inadequate denture storage and infrequent washing were among the causes of poor denture hygiene.<sup>8</sup> Other studies have also reported similar findings of improper denture storage and denture cleaning habits adopted by the patients.<sup>9,10</sup> In another study conducted in Malaysia by Noor et. al, it was reported that 78% of the complete denture wearers removed their dentures at night.<sup>11</sup> The results of this study are contrary to the findings of our study since only 28.75% of our patients removed the denture during night. This finding may be attributed to multiple factors, such as, patient education level and residence of the patient. Since most of the patients had only primary education level and belonged to rural areas.<sup>12</sup>

Similar to the findings of Pacharne et al, who reported that 68% of the patients do not remember the verbal and written instructions, in our study 51.25% did not remember the instructions given to them at the time of insertion.<sup>13</sup> This finding indicates the lack of denture hygiene practices among patients which may be associated with recall memory and age of the patient. A strong association ( $p < .001$ ) between low SES and poor denture cleanliness was identified in this study, presumably because of poor access to dental services, poor health literacy, and financial pressures. Many studies have reported that lower-income patients are less able to pay for denture cleansing products or routine dental examinations, which results in

more plaque buildup thus supporting our findings.<sup>14,17</sup>

In addition, the gender gap in hygiene scores, where females had higher scores in a study by Mushtaq et. al, who explained the difference as improved compliance with cleansing procedures.<sup>18</sup> The duration of denture wearing and hygiene scores were significantly different among the patients, which is also consistent with our study, where longer denture wear was found to be related to more staining and calculus buildup as a result of wear and tear.<sup>18</sup> In addition, calculus and staining on dentures not only detract from their aesthetic quality but also result in a rough surface that retains pathogens, predisposing remaining natural teeth to periodontal disease.<sup>9</sup> Systemic health is also compromised since oral pathogens from dirty dentures may be transported into the bloodstream and cause various complications in older patients.<sup>8</sup>

Further studies need to measure the long-term effect of patient education interventions on denture hygiene behaviour. Investigating the potential of new materials, including antimicrobial coatings or self-cleaning dentures, may also offer new solutions for enhancing hygiene outcomes. The creation of standardized procedures for denture care and education, adapted to various demographic groups, could provide greater adherence to denture hygiene practices. This research adds to the literature by highlighting important determinants of denture hygiene and calling for specific interventions to treat these concerns. By bridging the gap between patient behaviour and clinical success, this research establishes a basis for enhancing denture care and oral health.

## Conclusion

In conclusion, this research emphasizes the importance of demographic, socio-economic, and behavior-based variables to denture hygiene knowledge and practices. A strong association among low socioeconomic status, rural setting, and

deficient denture oral hygiene reinforces systematic obstacles to denture care like limited dental provision and financial insecurity. Moreover, the gender-specific variations in compliance with hygiene and the detrimental effects of extended denture use also support the literature. Based on these findings, specially designed, community-based education programs aimed at rural and low-income groups, as well as in-practice instruction in denture maintenance skills, should take priority. Further studies should investigate long-term outcomes of educational interventions and newer denture technologies on oral health.

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