

# Perception towards Materials and Methods Available for Maintenance of Denture

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**OBJECTIVE:** To evaluate perceptions about materials and methods available for post insertion denture care amongst removable denture wearers and to find out effect of education in adapting to correct methodology of cleaning the prosthesis.

**INTRODUCTION:** Ignorance about maintenance of oral prosthesis leads to many oral health related problems. Adequate understanding of post insertion care is significant for the longevity and comfort of the prosthesis.

**METHODS:** An aggregate of hundred patients were chosen using convenience sampling from the department of prosthodontics (OPD) of Dow Dental College and Dow international Dental College. Questionnaire was designed to evaluate objectives. Subjects were interviewed about age, gender, educational status, frequency, method of cleaning, soaking material and awareness about removal habits of denture before sleeping. The information acquired by this study was analyzed by utilizing SPSS programming version 16.0. Simple descriptive statistics was applied. Chi-Square test was applied to determine the association of education with cleaning methods test at p value < 0.05.

**RESULTS:** Majority of participants cleaned their dentures with tooth paste and brush (44%) while 62% clean them daily. Majority of subjects were removing their dentures (80%) before sleeping. Water was the most frequent (62%) soaking medium when denture was not in use. Adequate maintenance of dentures was significantly associated with level of education.

**CONCLUSION:** The perceptions of study participants towards denture maintenance were adequate.

**KEY WORDS:** Maintenance of denture, perceptions, prosthesis, cleaning of denture.

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## INTRODUCTION

Adequate cleaning of the dentures may rate low on the priority list of 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. Carelessness of keeping denture clean results in developing oral health related problems like stomatitis, malodor, bacterial endocarditis and fungal infections<sup>1</sup> which in turn cause denture discomfort and compromise persons health. Denture wearer might face disability of mastication speech, difficulty in social interactions and decline in general systemic health if their denture care is not adequate. Local infections can be minimized by keeping dentures out of oral cavity for 6 – 8 hours per day<sup>2</sup>. In another study<sup>3</sup> it was concluded that proper maintenance of denture enhance oral health and performance of prosthesis.

Diabetes Mellitus is a common disease among elderly patients, if they are using any kind of removable denture and unable to clean them adequately they are more prone to

develop denture induced stomatitis<sup>4</sup>. Another study<sup>5</sup> showed that denture maintenance follow-up visits have extreme importance in order to evaluate condition and oral health of wearer, majority of patients do not consult dentist for checkups of their dentures.

Denture surface is porous and rough which act as substrate for microorganism to adhere and grow. This may be aesthetically displeasing, cause of altered taste and foul smell from mouth. Oral health diseases related to prosthesis depend upon fitting surface, occlusion and cleaning habits of the denture<sup>6</sup>. An Invitro study by Charman K *et al.*<sup>7</sup> showed that dental biofilm formation accumulate more on rough surfaces than on smooth of prosthesis. Denture stomatitis is an inflammation of oral mucosa clinically that appears as localized redness due to localized denture irritation. It may also be associated with immune compromised state and drugs<sup>8</sup>. Past study conducted by Buket *et al.*<sup>9</sup> showed that there is a presence of positive association between poor oral hygiene and denture stomatitis. Adequate daily cleaning of dentures helped to minimize incidence of this condition.

Denture should be washed daily with non-abrasive denture cleaning products outside the mouth. It should not be immersed more than 10 minutes in bleaching.<sup>10</sup> Denture wearers should be informed about rinsing their mouth and denture after every meal whenever it is possible. It has been showed through studies that with age it is difficult to

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maintain hygiene due to reduced manual efficiency<sup>11</sup>. Assistance is required to help these kinds of patients for post insertion care of dentures.

Evaluation about our community awareness regarding denture care and convincing these patients to adopt a more stringent daily cleaning routine was the main purpose of utilizing this questionnaire in our survey. Study was conducted to compare socioeconomic conditions with denture hygiene awareness<sup>12</sup> but no study was done to compare the association of education on adapting proper denture cleaning methodology. The aim of our study is to assess perception towards maintenance of denture and association of education on adapting proper cleaning methodology.

### METHODOLOGY

This cross sectional survey was conducted among the denture wearers that visited for follow up to Dental Outpatient department of Prosthodontics in Dow Dental College, Karachi Pakistan from 15<sup>th</sup> December 2015, till 15<sup>th</sup>

January 2016. The estimated sample size was hundred, taking 97.6% prevalence on how the patients keep their dentures clean with 3% margin of error. A total of hundred participants were included in the study regardless of which material and time period the dentures are being made / used. All those individuals who refused to participate in the study and those who had any kind of neuromuscular disability were excluded.

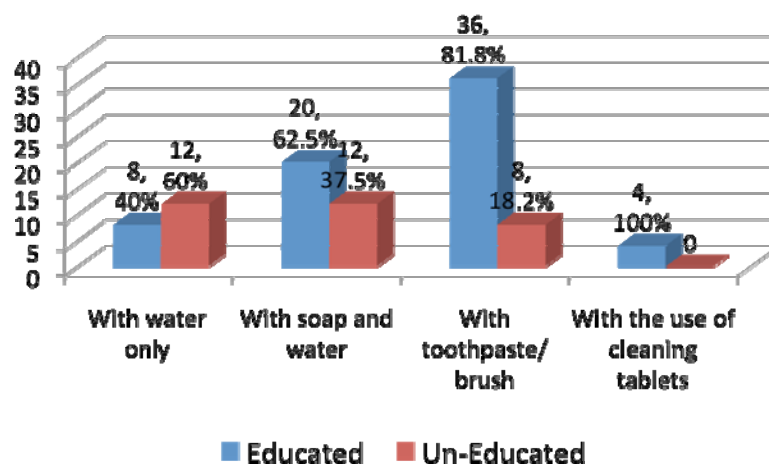
After acquiring permission from competent authorities, a questionnaire comprising of ten questions regarding denture maintenance was designed in English language. It was filled by researchers who interviewed the study participants. First part of the questionnaire was related to demographic details of participants like age, gender, education status and occupation. Participants having no primary education were considered uneducated and those who had received education from any institution either primary or secondary were considered as educated subjects. In second part, the perception towards denture cleaning habits, methods and frequency, status of information they had received from

**Table 1. Demographic information and replies of participants regarding their dentures.**

Characteristics	Number of Participants	Percentage
Age (in Years)	55.72 ± 10.87 years	
Gender	54	54
1. Female	46	46
2. Male		
Education Status		
1. Un Educated	32	32
2. Educated	68	68
Occupation		
1. None	36	12
2. House work	12	36
3. Office work	20	20
4. Labour	16	16
5. Medical Field	16	16
Duration of wearing denture		
1. 0-6 months	20	20
2. 6 month to 1 year	26	26
3. 1 year to 5 years	34	34
4. More than 5 years	20	20
Instructions provided to them on cleaning dentures		
1. Yes	74	74
2. No	14	14
3. Don't remember	12	12
Cleaning frequency of their dentures		
1. Whenever you feel it is dirty	32	32
2. Once a month	4	4
3. Daily	62	62
4. Do not clean	2	2

**Table 2.** Distribution of patients according to the denture cleaning method, removing their dentures before sleeping and use of soaking material used.

Methods Used	Number	Percentage
Denture cleaning method		
1. With water only	20	20
2. With soap and water	32	32
3. With toothpaste/brush	44	44
4. With the use of cleaning tablets	4	4
Patients removing their dentures before sleeping		
1. Yes	80	80
2. No	20	20
Patients using soaking material		
1. Water	62	62
2. Mouth wash	10	10
3. Bleaching solutions	6	6
4. Do not Soak	22	22

**Fig. (1).** Comparison among educated and un-educated using cleaning methods.

dentist on post denture insertion care and nocturnal denture wearing habits were noted. Before interviewing, participants were informed and assured verbally about keeping their provided information confidential.

The information achieved by this study was analyzed by utilizing SPSS programming version 16.0. Simple descriptive statistics and Chi-Square was used to determine the association of education with cleaning methods test at  $p$  value < 0.05.

## RESULTS

The demographic characteristics of participants are shown in Table 1. All subjects were in the age group of 55 to 65 years from both genders (females 54 and 46 males). Most of the participants were using denture since 1 to 5 years as shown in Table 1.

Regarding post denture insertion cleaning instructions by their dentist, 74% of participants had received instructions while 14% were not being informed about it. Most of them were cleaning daily by mechanical method (brushing) with toothpaste (Table 1).

Majority (80%) removed their dentures before sleeping (Table 2). On removal most of them were soaking in water as demonstrated in Table 2.

Fig. 1 portrays that proper cleaning methods were adapted adequately by educated participants while uneducated participants are not cleaning their dentures with correct methodology.

Chi-square test was applied to find out whether education is associated with proper cleaning methodology or not. Significant results were obtained ( $p$ -value=0.004) for using proper method of cleaning dentures when compared among educated and uneducated subjects.

## DISCUSSION

Adequate cleaning gives longevity to the prosthesis by maintaining health of oral tissues as it helps in reducing biofilm formation, bioburden of microorganism and fungal growth<sup>10</sup>. Maintenance of denture will be successful only when denture wearers are motivated and aware of correct methodology to be adapted. Maintenance of a denture can also be achieved by making patients aware about significance of follow up visits for their denture. In our study findings, 52.52% not went for follow up visits. Previous study concluded that denture wearers were not informed about preventive and maintenance care of their dentures<sup>9</sup>. Post insertion checkup visits was not found to be frequent might be due to lack of awareness, cost of dental visit or fear and anxiety to visit dentists. None other study has been done in this region for assessing comparison between educated and uneducated participants perception towards adapting appropriate methodology of cleaning prosthesis.

Our results demonstrate education was significantly associated with adequate denture cleaning, as shown in the result that 81% educated participant are using adequate method of cleaning.

A review done by Felton *et al.*<sup>10</sup> enlisted guidelines for the care and maintenance of denture in which they stated that daily removal of the prosthesis along with appropriate method of cleaning is necessary for maintenance of denture. In our study authors reveal that only 62% denture wearers are in the habit of cleaning dentures daily, 32% cleaned it when they found it dirty and 2% were not in a habit of cleaning their dentures.

Similar study was done by Dikbas *et al.*<sup>3</sup> and Marchinni *et al.*<sup>5</sup> showed that 82.9% and 77.5% patients did not receive denture care instructions from their dentists respectively, whereas in our study we found that denture wearers are getting proper instructions from their dentist the only lacking that we are facing in our region is proper follow-up visits which are of prime importance for the maintenance. The rationale of annual follow-up visits is that normal physiological process can produce changes in the bone structure. These changes might cause malfunction of prosthesis Felton *et al.*<sup>10</sup> recommended that denture wearers must go for post insertion visits annually for maintenance of denture fit, function and assessment of oral health status. Regarding post insertion visits for the maintenance of denture our study reveals that 48% went for follow-up visits and most of them that is 52% were not visited dentist for denture care. Low follow up visits from the denture wearer might be due to low economic status or lack of proper instructions given by the dentist.

For cleaning prosthesis, brushing with toothpaste reduces the biofilm formation as compare to use water alone as cleaning method<sup>13</sup>. Similar study done by Parajuli *et al.*<sup>14</sup> showed majority use water and some were using soap and water without use of brush. Results obtained by previous studies done by Marchini *et al.*<sup>5</sup> and Kulak Ozkan *et al.*<sup>15</sup> showed 84.9%, 79.7% brushed their dentures for cleaning respectively. In our study majority of participants that is 44%

use tooth paste and brush, whereas 20% of them use water for cleaning and 4% and use of cleaning tablets (chemical method) which is quite low among all findings. Dentifrices containing nonabrasive constituent such as calcium phosphate is recommended. Abrasives and bleaching components in tooth paste may cause surface abrasion<sup>3</sup>. Tooth brush containing soft filaments with low force application for cleaning of dentures is most advisable method by clinicians.

Chemical methods are simple to use but due to high cost and metal corrosion its usage is low. It is recommended for elderly with low motor skill responded denture wearers<sup>16</sup> Mechanical method (brushing) easy to use and inexpensive so it is the most popular method adapting for cleaning dentures by its wearers in developing countries, previously done studies stated that 100%<sup>17</sup>, 80%<sup>18</sup>, 79.7%<sup>5</sup> are using Mechanical (brushing) as a cleaning method. In past study effective recommended method of cleaning is combination of brushing and soaking<sup>19</sup>. Further research need to be done to find out preferred method against pathogens.

According to guidelines for care and maintenance of denture it is mentioned that denture should be immersed in water while not using it to avoid warping<sup>10</sup>. In our study most of participants reported soaking their dentures in water. Study opposes our finding that was done by Veres *et al.*<sup>16</sup> stated that only 5% subjects immerse their denture in water while it is not in use.. According to Felton *et al.*<sup>10</sup> denture should not be immersed in sodium hypochlorite (cleaning chemical) for time period more than 10 minutes. Placement of denture for longer duration in hypochlorite (NaOCl) may damage the denture. In study by Felipucci *et al.*<sup>20</sup> It is stated that sodium hypochlorite causes spot corrosion by oxidation of the surface; therefore it is not suitable for removable partial dentures. Peracini *et al.*<sup>17</sup> found that water was the most immersing media for denture followed by Naoel .

The results of this study suggest that there is need to encourage denture wearers for follow-up visits to maintain oral health. Guidelines of denture care and maintenance should be included in continuing education programs for dental practitioners. Keeping the fact in mind that literacy rate of Pakistan is low; according to survey done by UNESCO literacy rate is 55%. Government and related academic institutions must adopt and encourage alternative awareness methods like advertisements, denture care awareness programs with demonstrations, which should be conducted by professionals. There are inexpensive cleaning methods and materials are available but awareness need to be developed. Further research is required to be done to explore affective methods of mechanical and chemical denture cleaning against harmful pathogens.

## CONCLUSIONS

1. Majority of the study participants had received guidelines from dental practitioners that shows that dentists are educating enough about the maintenance of the denture.
2. There were noticeable differences in cleaning habits among educated compared to uneducated participants.

3. The frequently reported methods were Brush with Toothpaste 44%, followed by soap water 32%. Only 4% participant used tablets.

### CHOOSE THE BEST QUESTIONS

1. Most popular method adopted for cleaning denture wearers is:
  - a. Chemical method
  - b. Mechanical method
  - c. Ultrasonic method
  - d. Microwave method
2. Preferred method of denture cleaning according to clinician advise:
  - a. Chemical method
  - b. Combination of chemical and mechanical method
  - c. Mechanical method
  - d. Ultrasonic method
3. Reason of low usage of chemical method amongst denture wearers:
  - a. High cost and metal corrosion
  - b. Warpage and discoloration
  - c. Surface abrasion and discoloration
  - d. Foul smell and bad taste
4. Immersion time for denture in sodium hypochlorite should not exceed more than 10 minutes because it can cause:
  - a. Discoloration
  - b. Spot corrosion
  - c. Warpage
  - d. Cracks

**Note: Correct Answer in Bold Font**

### AUTHORS CONTRIBUTION

Dr. Aisha Kiran conceived and designed the study, also responsible for manuscript topic selection, questionnaire designing, patient selection, interviewing of patients, data entry, data analysis and write up. Dr. Faiza Amin participated and provided her assistance in designing the study, data entry and writing the manuscript.

### DISCLOSURE

Declared none.

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