

Original Article

Denture Hygiene And Oral Health Knowledge And Behavior Among
Patients With Removable Dentures In Academy Dental Teaching Hospital

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Abstract:

Introduction: Removable denture is one of the most common used treatment for rehabilitation of teeth loss. Patients should be aware of correct prosthesis use and hygiene. Dentists should provide those patients proper denture hygiene instructions.

Objectives: This study aims to evaluate removable denture patient's level of knowledge and their behaviors to maintain oral health and denture hygiene in Academy dental teaching hospital during (2022-2023).

Methodology: A descriptive cross-sectional study is conducted with a sample of 120 patient, they were selected using simple random sampling technique from prosthesis department records since 2015 till 2022. A modified questionnaire was done for data collection using telephone based interviews. Patient privacy was maintained and a verbal approval has been taken. Data has been analyzed using SPSS version 22, Microsoft Excel application, comparison between variables was done using chi-square test with statically level of significance set at $p \leq 0.05$.

Results: (54.2%) of the participants were males while (45.8%) were females. Majority of patients have an average level of knowledge about the impact of denture hygiene on oral health

and overall health, and denture hygiene techniques and keeping methods (39.2%). (50%) of the patients cleaned their dentures once daily, water and toothpaste being most common method for denture cleaning(46.7%).Most of the patients store their dentures in water(69.2%). (60%)of the patients wear their denture during day time but all of them change their dentures only in case of need (100%), (55%) of patients will ignore if cracks or soft and hard deposit present in their dentures. (93.3%) of patients have received instructions from the dentist.

Conclusion:

In this study it has been demonstrated that majority of the patients have average level of knowledge about oral health and denture hygiene, their behaviors and hygiene measures are considered to be unsatisfactory. Most of the patients received instructions from the dentist, but do not go for regular. Check-up. Patient's extent of maintenance is low.

Keywords: Denture Hygiene, Oral health, Knowledge, Behavior, Patients with removable dentures.

Introduction:

Teeth loss could result from caries, periodontal disease, trauma, infection, malignancies, or failed endodontic treatments. It is a major problem that causes impaired mastication, phonetic, function and esthetics resulting in loss of self- confidence. Teeth loss affects the remaining dentition causing alveolar bone resorption followed by periodontal disease and recession , drifting of adjacent teeth and supra- eruption of the opposing teeth to the edentulous space creating plaque accumulation sites leading to development of new caries and may also affect Temporomandibular Joint (TMJ) health (1).

The loss of some or all of the original teeth from the dental arch can be replaced by several methods including removable dentures.

Removable dentures, better known as false teeth, are prosthetic teeth made from materials such as acrylics, nylon, or metal, which fit over the gums and are supported by teeth and mucosa replacing one or more teeth that have been lost and can be removed by the patient. Removable partial denture supplies teeth and associated structures on a partially toothless jaw while

removable complete denture supplies teeth on a completely toothless arch (2). The artificial prosthesis can act as plaque retentive factor in patients with poor oral hygiene leading to caries and inflammation of periodontal tissue causing excessive alveolar bone pocket and resorption and lesions in the oral mucosa such as hyperemia, ulceration and edema (3). The most prevalent oral lesion associated with wearing of removable dentures is denture stomatitis caused by reproduction of candida species and bacteria in the oral cavity, characterized by erythema of mucosa covered by denture with or without symptoms like burning sensation. Denture stomatitis is one of the most common oral mucosal lesions with a prevalence rate of 15–70% and can become chronic if left untreated (4). Additionally, an increase in the microbial load in the mouth can have negative effects on systemic health. This can increase the risk of infection, especially in individuals with a weak immune system (5) . Other types of oral mucosal lesions include traumatic ulcers, angular cheilitis, epulis fissuratum, and unsupported ridge (6). Chronic lesions of oral mucosa can lead

to oral carcinoma. Inadequate hygiene practices may cause halitosis and bacterial endocarditis. Overnight denture wearing can lead to oral inflammations and even pneumonia (7,8). Food particles located between denture and oral mucosa allows multiplication of bacteria usually presenting in micro-fissures or roughness on the denture surfaces and serve as reservoir for infections with gastrointestinal and pleura pulmonary involvement (9,10). So appropriate denture hygiene is a very important factor for maintaining mucosal tissue health and overall health.

Dentures can be cleaned mechanically, chemically or like a combination of these two methods, most popular mechanical mechanism is by toothbrush, while many chemical products are available-alkaline peroxides, alkaline hypochlorite, inorganic acids and enzymatic detergents (8).

Regular attention to oral and denture hygiene are vital in maintaining removable dentures' long-term use(11). Studies have revealed that individuals exhibit inadequate denture care practices and have inappropriate oral hygiene habits are usually lack knowledge about oral health care (12).

The dentist when fitting the removable denture should instruct patients about its proper use, important information concerns

the necessity to take out the removable dentures for at least 6-8 hours during the night and keep them in water, using denture cleansers, rinsing the denture and mouth after every meal and brushing the both denture and mouth with toothbrush (2). According to guidelines provided by the American College of Prosthodontists in 2011, it is recommended that dentures be stored in water after cleaning and when not in use (13). The dentist provides both written and verbal instructions regarding denture care and should not be overlooked to ensure proper understanding and instructions' retention (14).

Fitting removable dentures does not mean the final stage of treatment and the patient should remain under the constant control of the dentist by scheduling regular follow-up appointments. Patients' compliance should be evaluated and encouraged each visit. Regular dentist visits and patients' compliance with periodic dentist visits can help in diagnosing diseases early and beginning appropriate treatments (15).

Dental professionals must have a current knowledge of denture cleansing strategies to maximize the services offered to their denture patients (16). The aim of this study is to evaluate and investigate level of knowledge and behaviors in patients with removable dentures in Academy dental teaching hospital (2022- 2023).

Methods:

We conducted a descriptive cross-sectional study, hospital base. This study was targeting adult patients suffering from partial or complete teeth loss and removable dentures were done for them by dental students and interns in the Academy dental teaching hospital, University of Medical Sciences and Technology (UMST), Khartoum. A simple random sampling technique was used to select study participants. Total number of patients with removable dentures in the records from 2015 till 2022 was found to be 280 patients, by using the formula $n = N/(1+N(e)^2)$. Where n = the study sample; N = the study population (280); e = the margin of error (0.05).

The calculated sample size was found to be $n= 164$. Data was collected using telephone based interviews from patient's records from 2015 till 2022.

A modified questionnaire, from previous studies (10, 17), was structured with open and closed questions to be used for data collection. The first section included 3 questions for demographic data

(age, gender and medical status), the second section consisted of 5 knowledge-based questions (impact of denture hygiene on oral health and overall health, denture hygiene techniques and keeping methods), using

modified likert scale and scoring system for the variables. A pilot study was performed in 10% of the population. The Likert scale started from 4 for (strongly agree) to 0 for (strongly disagree, I don't know). Overall knowledge score of 0-9 was considered poor; 10-14 was average knowledge and 15 to 20 was excellent knowledge. The third section consisted of questions relating to patient's behaviors toward their denture hygiene and oral health.

Data was cleaned, organized and entered in a master sheet using personal computer then analyzed by Statistical Package for Social Sciences (SPSS) version 22, and Microsoft Excel application. Descriptive statistics of the results were presented in form of Tables and Figures, categorical variables were described in percentages and frequencies, and comparison between variables like the comparison between patient's level of knowledge and different denture type was done using chi-square test with statistical level of significance set at $p \leq 0.05$.

Ethical clearance and approval for conducting the research was received from the Ethical Committee of Faculty of Dentistry, UMST and The Academy secretary. Patient's privacy and confidentiality were maintained and, verbal approval was taken before starting the questionnaire. Patients who refused were excluded from the study. The questionnaire was anonymous and data will only be used for research purposes.

Results:

The intended sample size was 164 however the response rate was 120 participants due to difficulties contacting eligible participants from medical records, including unanswered calls, changed or switched-off phone numbers, and patients travel. Also poor documentation had its effect on reaching the aimed sample size. 65 patients were males (54.2%) while 55 patients were females (45.8%). Most of the age range between 56 and 65 (38.3%). Majority of patients were medically compromised, hypertension being the most common disease among patients (23.3%), most of the patients were wearing RPD (68.3%), and the average years of denture wear for most of the patients was found to be from 1 to 5 years (47.5%). Majority of patients have average level of knowledge

about the impact of denture hygiene on oral health and overall health, and denture hygiene techniques and keeping methods (39.2%). Relation between patient's level of knowledge and different denture types, was found to be significant with P value = 0.001. (60%) of the patients wear their denture during day time All of participants change their dentures only in case of need (100%). (93.3%) of patients received instructions from the dentist. (55%) of patients will ignore if cracks or soft and hard deposit present in their dentures and (45%) will contact the dentist. Water and tooth paste being most common methods for denture cleaning (46.7%) followed by water and soap with 35.8% and water only 17.5 %. Most of the patients store their dentures in water while not in use (69.2%).

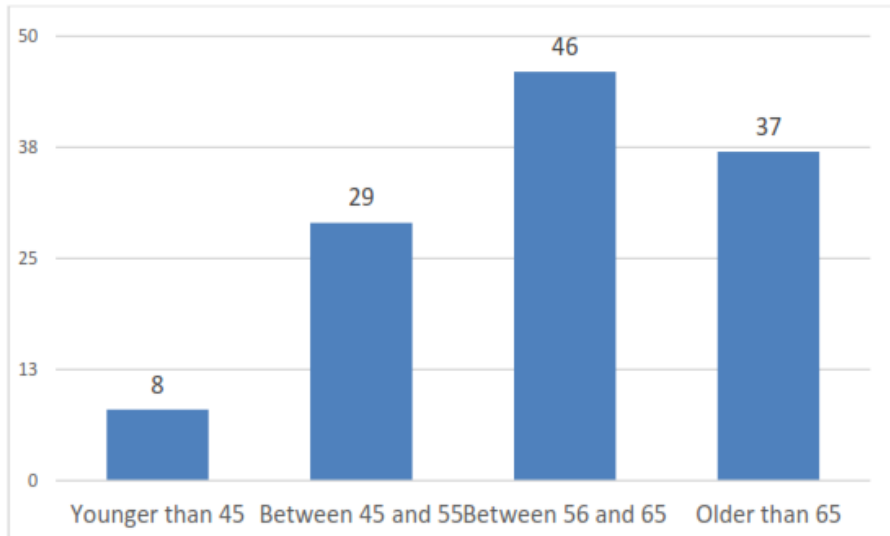


Figure1: The Age of the participants

Table (1): Medical status, Denture type and Average years of denture wearing.

		Frequency	Percent
Systemic diseases	None	38	31.7
	Diabetes and hypertension	19	15.8
	Diabetes	23	19.2
	Hypertension	28	23.3
	Asthma	12	10
Denture type	Removable Partial denture	82	68.3
	Removable complete denture	38	31.7
Average years of denture wearing	Less than one year	20	16.7
	1- 5years	57	47.5
	More than 5 years	43	35.8
	Total	120	100

Table (2): Patient’s level of knowledge about impact of denture hygiene on oral health and overall health, denture hygiene techniques and keeping methods.

Patient’s level of knowledge	strongly agree	agree	neutral	disagree	don't know	Total
Q1: Oral health is affected by quality of denture hygiene.	63	30	16	2	9	120
	52.5%	25%	13.3%	1.7%	7.5%	100%
Q2: Denture should be changed even if it is not broken.	2	14	25	43	36	120
	1.7%	11.7%	20.8%	35.8%	30%	100%
Q3: Oral lesions are risk factors for more sever systemic diseases.	15	29	25	5	46	120
	12.5%	24.2%	20.8%	4.2%	38.3%	100%
Q4: Denture cleaning is as important as oral and dental brushing.	53	38	16	1	12	120
	44.2%	31.7%	13.3%	0.8%	10%	100%
Q5: Dentures need special storage method.	55	25	20	4	16	120
	45.8%	20.8%	16.7%	3.3%	13.3%	100%

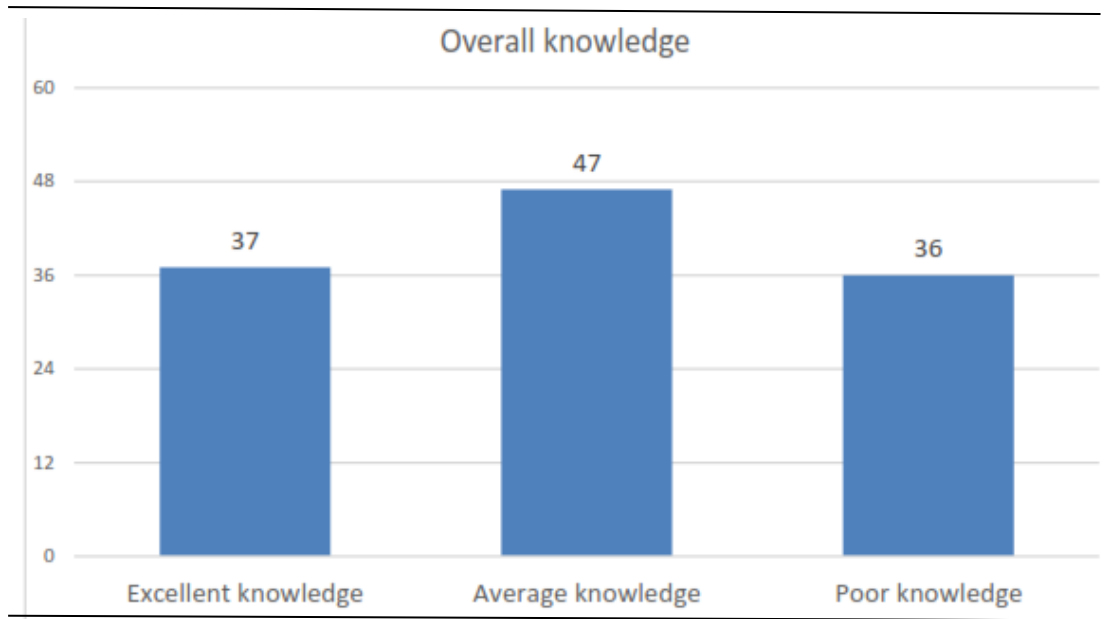


Figure2: Over all knowledge

Table (3): Comparison between patient’s level of knowledge and different denture type.

Patient’s level of knowledge	Excellent Knowledge Frequency N Percents %	Average knowledge Frequency N Percents %	Poor knowledge Frequency N Percents %	Total Frequency N Percents %
Removable Partial denture	33	31	18	82
	27.5%	25.8%	15%	68.3%
Removable complete denture	4	16	18	38
	3.3%	13.3%	15%	31.7%
Total N	37	47	36	120
percent %	30.8%	39.2%	30%	100%

Chi square test performed, P value =0.001,P value is significant

Table (4): Dentist consultation when cracks or soft and hard deposit present in Denture:

Dentist consultation (cracks or soft and hard deposit)	Frequency	Percent
Contact the dentist	54	45%
Ignore it	66	55%
Total	120	100

Denture usage time	Frequency	Percent%
Day and night	30	25 %
During day time	72	60 %
Only while eating	18	15 %
Total	120	100%

Table (5) : Denture usage time:

Discussion

Status of the denture helps to access the oral health condition. Prosthesis should be cleaned properly to prevent biofilm development. Routine dental care improves quality of life by maintaining maximum health (18).

A total of 120 patients were reviewed from age 40 to75. (54.2%) were males and (45.8%) were females. Most of the patients (68.3%) were wearing removable partial

dentures. (47.5%) of the patients

had their dentures for about 1 to 5 years ago, agrees with study done by (Rania Moussa ,et al)in Saudi Arabia (16).

After evaluating patient's level of knowledge about oral health and denture hygiene, most of the patients were having average overall knowledge (39.2%) which is worse than a study done in Indonesia by (Masulili C, et al) where most of the

Denture Hygiene And Oral Health Knowledge patients were with excellent level of knowledge(48.5%), that's may be because our study was done in a developing country while Indonesia is an industrialized country and this difference affects patient's level of awareness (19).

Patient' behaviors and practices toward the dentures hygiene and oral health was found to being sufficient, agrees with a study carried out in India by (FaziyaP,Sherin H) and another study done by (Aoun G, et al)in Lebanon (9,15).

Regarding patient's extent of awareness about the effect of denture hygiene on oral health and its impact on overall health, more than half of the patients strongly agreed that oral health is affected by quality of denture hygiene (52.5%).

Most of the patients didn't know that oral lesions act as risk factor for sever systemic diseases (38.3%). It is because of the average overall knowledge that most of the patients have.

In concern to patient's level of knowledge about the proper usage techniques and keeping methods of their removable dentures, majority of the patients strongly agreed that denture cleaning is as important as oral and dental brushing (44.2%). (45.8) of the patients agreed that dentures need special storage method.

This is justified by result that showed most of the patients have received instructions

Walaa Elsidig & Dalia Ahmed regarding denture cleaning and maintenance. Relation between denture type, average years of denture wearing and patient's level of knowledge were found to be significant, p value = (0.001 and 0.021) respectively. Higher level of knowledge with removable partial denture users and newly wearers is because most of them are young adults so they are more eager and assiduous.

All of the patients tend to change their dentures only in case of need (100%), agrees with (Faziya Pand Sherin H) study, where (91%) of patients change their dentures in case of need too (9).

Most of patients said that they would ignore if they found cracks or soft and hard deposits on their dentures. This could be because of poor socio economic and compromised medical status of the patients that creates barriers to regular and preventive dental care, making them more prone to oral ulcers and denture related stomatitis (20).

Observing patients compliance to follow dentist's instructions, most of the patients (93.3%) have received instructions from the dentist as in previous studies conducted Rania Moussa,et al) and (Mita Shaha, et al) (16,21) and counter to many other studies

Conducted by (Tinuma, et al) and (Namrata, et al) (22,18). Although most of the patients use their dentures during day time (60%), in consistent with previous studies conducted by (Fazia P, Sherin H) and (A Chhabra, et al)

(9,23)

Dentures should not be used at night or should be removed for a certain period during the day so that the supporting tissues can recover from the trauma caused by physical contact (24). Wearing dentures at night is associated with denture stomatitis

(25)

In the present study majority of patients clean their dentures with water and tooth paste (46.7%) similar to many previous studies carried out by (Tosun B et al) (Szalewski L, et al) , (Pacharne AP, et al) , (Mita Shaha, et al) , (T Iinuma, et al) , and (Apostolov N, et al) in Bulgaria, whereas (Namrata,et al) and (Chhabra, et al) results showed that water is the most common method used by patients for denture cleaning, but no relation found between method of denture cleaning and receiving instructions (26 ,21,21 ,22 ,8 ,18 ,23).

Mechanical methods are often preferred because most people use toothbrushes and toothpaste during dental cleaning, so they continue this habit even if they lose their teeth (27).

On the other hand, most of the patients store their denture in water while not in use, decreasing the chance of denture wrapping similar to (Algabri et al)(A Chhabra, et al) and (Moussa R, et al) studies results and

better than (Faziya P and Sherin H)(28 ,16 ,23 ,6 ,9). Maybe because dentists reassure and focus on the storage media assuming that patients will forget about it.

Conclusion:

In this study it has been demonstrated that majority of the patients have average level of knowledge about oral health and denture hygiene, their behaviors and hygiene measures are considered to be unsatisfactory.

Most of the patients received instructions from the dentist, but do not go for regular check-up. Patient's extent of maintenance is low.

Recommendations

1. As the awareness regarding denture hygiene and oral health is not good enough, more efforts should be done to raise the awareness through utilizing the mass media as it becomes widely consumed by all population.
2. Written instructions should be given in addition to verbal explanation.
3. More education about the importance of regular dental

Denture Hygiene And Oral Health Knowledge visits and the impact of oral health negligence on overall health.

4. Placing of wall posters all around the clinic showing the correct way to clean and keep the dentures to remind the dentist and guide.

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