

Causes and Pattern of Non Compliance with Instructions given after Fitting of Removable Partial Dentures (RPDs) among Patients in a Nigerian Teaching Hospital

Ogunrinde TJ

Department of Restorative Dentistry, University of Ibadan/University College Hospital, Ibadan.

Email: tunde_ogunrinde2001@yahoo.com

Abstract

Objective: The study was carried out to assess the pattern of non compliance with instructions given after fitting of RPDs and to evaluate the reasons for non compliance.

Patients and method: The study was a cross-sectional study among consecutive denture wearers in a Nigerian teaching Hospital. An interviewer administered questionnaire was used to assess the pattern and causes of non-compliance with post denture insertion instructions. Data collected were imputed into a personal computer and analyzed using SPSS version 16. Chi-square was used to test association between categorical variables. The level of significance was set at $p < 0.05$.

Results: Two hundred and thirty two patients, participated in the study. One hundred and twenty nine patients did not comply with brushing the denture with brush and soft soap. The proportion of males (56.9%) and patients above 40 years (61.0%) that did not comply was greater than the proportion of females (54.3%) and patients 40 years and below (41.2%) respectively. There was a statistically significant relationship between the age of the patient and non compliance with cleaning the denture with soft soap.

One hundred and ninety four patients did not comply with twice annual routine visit to dentist. The proportion of males (84.5%) and patients above 40 years (84.1%) that did not comply was greater than the proportion of females (82.8%) and patients 40 years and below (82.4%) respectively.

The reasons for non compliance with cleaning denture with brush and soft soap included; more convenience (4.3%), detest the taste of soap (5.6%), while the reasons for non compliance with routine visit to dentist included no time (15.1%), financial problem (12.1%), and "I see no need for it when there was no dental problem" (44.0%).

Conclusion: Non compliance is more common among male patients and patients above forty years. Dentists should lay more emphasis on post denture insertion instructions especially for male patients.

Key words: Causes, denture, instruction, non-compliance.

Introduction

When edentulous patients are rehabilitated with denture, the important phase of oral and denture after-care begins. The success or otherwise of using the denture depends on this aftercare. Instructions on the after-care of the denture are usually given during the fitting of denture and these contain detailed information on appropriate daily denture cleaning measures, wearing habits and periodic visits

to the dentist for maintenance purpose. These instructions are given in oral, written or combination of oral and written form by the dentist or his/her assistant.

Many studies^(1,2,3,4) have shown various negative effects of non compliance with instructions given after fitting of removable partial dentures (RPDs). Poor denture and oral hygiene were reported to be associated with non compliance with twice daily

cleaning of denture¹, while a study on oral hygiene habit and denture cleanliness in elderly people by Kulak-Ozkan et al² observed a significant relationship between non-compliance with denture cleaning method and denture stomatitis. In other studies, overnight wearing of denture was found to be related with oral malodour^{3,4}, denture stomatitis^{1,5} and increased residual ridge resorption⁶. Ogunrinde and Opeodu⁷ also observed that brushing the denture intraorally was related to poor denture and oral hygiene. Failure to comply with correct cleaning technique can also lead to staining of denture which can mar the aesthetic⁸ or cause the coating of the denture with bacteria plaque which could damage the adjacent mucosa and cause systemic disease⁹.

Despite the fact that compliance with post denture insertion instructions is an important component of successful management of edentulous patients, there appears to be limited literature on patients' compliance with post denture insertion instructions in our environment. The purpose of this study therefore was to assess the pattern of non-compliance with instructions given after fitting of RPDs and to evaluate the reasons for non compliance.

Patients and method

The study was a cross-sectional study in which consecutive denture wearers that presented at the prosthetic clinic of a Nigerian Teaching Hospital during a study period of twelve months were recruited. Inclusion criteria included patients that had been using denture for at least 6 months, and were willing to participate. In addition, patients that were in good physical and mental condition were included. A twenty-item semi structured interviewer administered questionnaire developed by the investigator and applied by a trained resident doctor was used to assess patients' compliance with post denture insertion instructions. The questionnaire incorporated patients' demographic data, the methods, techniques and device used for cleaning the denture; whether the patients used to sleep with their dentures at night or not. The reason(s) for non compliance response(s) was also sought for by the questionnaire.

Ethical clearance was obtained from University of Ibadan / University College Hospital Ethical Review

Committee. Verbal consent was obtained from each patient and confidentiality was maintained by not writing the names of the participants in the questionnaire. Data collected were imputed into a personal computer and analyzed using Statistical Packages of Social Sciences (SPSS) version 16. Chi-square was used to test association between categorical variables. The level of significance was set at $p < 0.05$.

Results

Two hundred and thirty two patients participated in the study. There were 116 (50%) males and 116 (50%) females. One hundred and sixty four (70.7%) of the participants were above 40 years in age. One hundred and twenty nine patients did not comply with brushing the denture with toothbrush and soap. The proportion of male patients that did not comply (56.9%) was slightly greater than females (54.3%) while the proportion of patients above 40 years that did not comply (61.0%) was greater than patients of 40 years and below (41.2%). However, there was no statistically significant relationship between the gender ($p=0.396$) but significant relationship with age ($p=0.003$) of the patients and non compliance with instruction to brush the denture with brush and soft soap. Nineteen patients cleaned their dentures introrally. The proportion of male patients that did not remove denture from mouth for cleaning (10.3%) was greater than females (6.0%) while the proportion of patients above 40 years that did not comply with the instruction to remove denture from mouth for cleaning (11.0%) was greater than patients 40 years and below (1.5%). There was no statistically significant relationship between the gender ($p=0.169$) but significant relationship with age ($p=0.01$) of the patients and non compliance with instruction to remove denture from the mouth for cleaning. One hundred and thirty one patients cleaned their denture once daily against twice daily instruction given during fitting of dentures. The proportion of male patients that did not comply with twice daily cleaning of denture (58.0%) was slightly greater than females (55.2%) while the proportion of patients above 40 years that did not comply (53.7%) was less than patients 40 years and below (63.2%) (**Table 1**).

Table 1: Age and Gender Distribution of pattern of non compliance with instructions on method and frequency of cleaning denture

Instructions to patients	Patients' demography	Types of compliance		Total No	P – value	
		Compliance No	Non compliance No			
Use tooth brush and toilet soap for cleaning of denture	Male	50 (43.1%)	66 (56.9%)	116 (50%)	0.396	
	Female	53 (45.7%)	63 (54.3%)	116 (50%)		
	Total	103 (44.4%)	129 (55.6%)	232 (100%)		
	= 40 years	40 (58.8%)	28 (41.2%)	68(29.3%)		0.003*
	> 40 years	63 (38.4%)	101 (61.6%)	164 (70.7%)		
Total	103 (44.4%)	129 (55.6%)	232 (100%)			
Remove denture from mouth for cleaning	Male	104 (89.7%)	12 (10.3%)	116 (50%)	0.169	
	Female	109 (94%)	7 (6.0%)	116 (50%)		
	Total	213 (91.8%)	19 (8.2%)	232 (100%)		
	= 40 years	67 (98.5%)	1 (1.5%)	68(29.3%)		0.010*
	> 40 years	146 (89.0%)	18 (11.0%)	164 (70.7%)		
Total	213 (91.8%)	19 (8.2%)	232 (100%)			
Clean the denture at least twice daily	Male	49 (42%)	67 (58.0%)	116 (50%)	0.396	
	Female	52 (44.8%)	64 (55.2%)	116 (50%)		
	Total	101 (43.5%)	131 (56.5%)	232 (100%)		
	= 40 years	25 (36.8%)	43 (63.2%)	68(29.3%)		0.116
	> 40 years	76 (46.3%)	88 (53.7%)	164 (70.7%)		
Total	101 (43.5%)	131 (56.5%)	232 (100%)			

Table 2 showed that seventy patients wore their denture while sleeping at night. The proportion of male patients that did not comply with removal of their dentures from mouth when going to bed at night (31.0%) was slightly greater than females (29.3%) while the proportion of patients above 40 years that did not comply (28.7%) was less than patients 40 years and below (33.8%). There was no significant relationship between the gender and age of the patients and non compliance with instruction to

remove denture from the mouth at night ($p= 0.443$ and 0.265 respectively).

One hundred and ninety four patients did not comply with once or twice annual routine visit to a dentist. The proportion of male patients that did not comply (84.5%) was greater than females (82.8%) while the proportion of patients above 40 years that did not comply (84.1%) was greater than patients 40 years and below (82.4%) (**Table 2**).

Table 2: Age and gender distribution of pattern of non compliance with instructions to remove denture at night and routine visits to dentists

Instruction to patients	Patients' demography	Types of compliance		Total No	P- value
		Compliance No	Non compliance No		
Remove denture from mouth when going to sleep at night	Male	80 (69%)	36 (31.0%)	116 (50%)	0.443
	Female	82 (70.7%)	34 (29.3%)	116 (50%)	
	Total	162 (69.8%)	70 (30.2%)	232 (100%)	
	= 40 years	45 (66.2%)	23 (33.8%)	68(29.3%)	0.265
	> 40 years	117 (71.3%)	47 (28.7%)	164 (70.7%)	
	Total	162 (69.8%)	70 (30.2%)	232 (100%)	
Visit dentist for review once or twice per year	Male	18 (15.5%)	98 (84.5%)	116 (50%)	0.430
	Female	20 (17.2%)	96 (82.8%)	116 (50%)	
	Total	38 (16.4%)	194 (83.6%)	232 (100%)	
	= 40 years	12 (17.6%)	56 (82.4%)	68(29.3%)	0.437
	> 40 years	26 (15.9%)	138 (84.1%)	164 (70.7%)	
	Total	38 (16.4%)	194 (83.6%)	232 (100%)	

Table 3 showed that 103 (44.4) of the respondents used toothbrush and soap while 107 (46.1%) used toothbrush and paste for cleaning of their dentures. One hundred and seventy eight (76.7%) patients claimed they were instructed to use the material, 13 (5.6%) chose toothbrush and paste because they detested the taste of soap and 10 (4.3%) stated that it was more convenient to use tooth brush and paste. Nineteen patients cleaned their denture intraorally; while 213 (91.7%) took it out to clean. Nine (3.9%)

respondents stated that they just chose to clean the denture intraorally while 2.6% stated that it was more convenient to clean it with rest of the teeth. One hundred and thirty one (56.5%) participants brushed their dentures once daily and 42 (18.1%) stated that it was the instruction from dentist, while 63 (27.2%) reported brushing the natural teeth once daily and 26 (11.2%) stated "no time" as the reasons for once daily cleaning of the denture (**Table 3**).

Table 3: Distribution of materials, methods and frequency of cleaning denture against reasons for the responses

Material use for cleaning denture	Reasons for the material					Total No
	I was given the instruction	It is more convenient	I detest the taste of soap	I just chose the device	Others e.g for proper cleaning	
Toothbrush & soap	103(44.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	103 (44.4%)
Tooth brush & paste	75(32.3%)	10 (4.3%)	13 (5.6%)	8 (3.5%)	1(0.4%)	107 (46.1%)
Others e.g sponge	0 (0%)	7 (3.0%)	2 (0.9%)	7 (3.0%)	6(2.6%)	22 (9.5%)
Total	178 (76.7%)	17 (7.3%)	15 (6.5%)	15(6.5%)	7 (3.0%)	232 (100%)
Reasons for the cleaning method						
Methods of cleaning denture	I was given instruction	I just chose the method	It is more convenient	I have no time	others	Total
Clean intraorally	1 (0.5%)	9 (3.9%)	6 (2.6%)	3 (1.3%)	0 (0%)	19 (8.3%)
Take it out to clean	209 (90.1%)	1 (0.4%)	2 (0.9%)	1 (0.4%)	0 (0%)	213 (91.7%)
Total	210 (90.6%)	10 (4.3%)	8 (3.4%)	4 (1.7%)	0 (0%)	232 (100%)
Reasons for the frequency of cleaning denture						
Frequency of denture cleaning	I was instructed	I have no time	I brush once daily	others	Total	
Once daily	42 (18.1%)	26 (11.2%)	63 (27.2%)	0 (0%)	0 (0%)	131 (56.5%)
Twice or more	101 (43.5%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	101 (43.5%)
Total	143 (61.6%)	26(11.2%)	63 (27.2%)	0 (0%)	0 (0%)	232 (100%)

Table 4 showed that seventy (30.2 %) patients were not removing their denture while sleeping at night and the reasons for this action include; "not comfortable without the denture" 22 (9.5%), "I just chose to do so" 19 (8.2%), and "to avoid embarrassment" 16 (6.9%). Also, the majority (83.7%) of the respondents visited the dentist only

when they needed treatment. The reasons why majority did not comply with instruction on routine dental visit include; "no need for it when there was no problem" (44%), "no time" (15.1%) and "financial problem" (12.1%). Others included "I don't like to go to hospital" and "I was not told" (**Table 4**).

Table 4: Distribution of compliance with instruction on denture removal while sleeping at night and routine visit to dentist against reasons for the responses.

Do you remove your denture at night?	Reasons for the responses					Total
	Instruction given to me	I just choose	Not comfortable	To avoid embarrassment	Others e.g. not to misplace it	
Yes	162 (69.8%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	162 (69.8%)
No	0 (0%)	19 (8.2%)	22 (9.5%)	16 (6.9%)	13 (5.6%)	70 (30.2%)
Total	162 (69.8%)	19 (8.2%)	22 (9.5%)	16 (6.9%)	13 (5.6%)	232 (100%)

Frequency of visit to dentist	Reasons for the responses					Total
	Instruction by the dentists	No time	Financial reason	I see no need for it	Others	
At least once in a year	37 (15.9%)	0 (0%)	0 (0%)	0 (0%)	1 (0.4%)	38 (16.3%)
When I needed treatment	0 (0%)	35 (15.1%)	28 (12.1%)	102 (44.0%)	29 (12.5%)	194 (83.7%)
Total	37 (15.9%)	35 (15.1%)	28 (12.1%)	102 (44.0%)	30 (12.9%)	232 (100%)

Discussion

Wearing RPDs may have adverse effects on the health of both the oral and denture supporting tissues and these adverse effects can be aggravated by non-compliance to instructions given during fitting of RPDs. Since the objectives of prosthetic restoration of edentulous mouth are not only to promote good masticatory and aesthetic functions, but also to maintain the health of the remaining oral structures, it is important that compliance to post-denture insertion instructions be given appropriate attention.

This study showed that a high percentage of the patients brushed their dentures with toothbrush and paste instead of using soft soap as instructed by the dentists. The practice of using toothbrush and soap was encouraged to avoid possibility of surface roughness by abrasive in tooth paste,^{10,11} however, a recent study on oral hygiene habit among denture wearers revealed no adverse effect

on dentures as a result of brushing with toothpaste⁷. The reason stated by the majority of the participants for using toothpaste was that it was the instruction given them. This reveals inadequacy of oral instruction alone used in the centre. Rebeiro et al³ reported improvement in compliance with post denture insertion instructions when written and verbal instructions were combined. Nineteen patients cleaned their dentures intraorally and there was a significant relationship between intraoral cleaning of the denture and age of the patient. The major reasons stated for cleaning the denture intraorally were "it was more convenient" and "I just chose to do so". The non compliance may be age related problem. Elderly patients often face difficulty in removing their denture for cleaning because of reduced manual dexterity or physical limitation¹². To enhance compliance, dentures for older age group should be made easier to remove. More than half of the respondents showed non-compliance to at least twice daily cleaning of the

denture. This is similar to the finding of Dikkas et al¹³ in which 70% cleaned their denture once daily. The majority of the participants practiced once daily brushing of their dentures because they brush their teeth once daily. This is similar to Takamiya et al¹⁴ study that reported once daily brushing of teeth by RPD wearers as a reason for once daily brushing of their dentures. This study showed that non-compliance was more common among males. This is similar to the report of Ribeiro et al³ in which majority of their subjects that did not comply with twice daily cleaning of denture were males. The reason for this could be the fact that males are less concerned about their health¹⁵. Also non compliance was more common among patients with age greater than 40 years. This could be due to the effect of aging on patients' attitude to health related measures. In a review of literature on compliance to medications, the elderly was found to be less compliant than the young age group¹⁶. Some of the possible reasons given for non compliance by the older patients in the review of literature include low education level¹⁷ and the high possibility of age related problems with vision, hearing and muscular coordination among older age group¹⁸.

The majority of the subjects did not comply with the instruction to visit dentist at least once in a year for routine checkup. This is similar to the finding of Marchini et al¹ in which 66.5% did not consult a dentist more than 6 years after the last appointment. The major reasons for non compliance with routine visit to a dentist were stated as: "I see no need for it and no time". This is contrary to the report by Takamaya et al¹⁴ that stated that economic reason was the major factor for non-compliance. The economic reason as a major factor of non-compliance was supported by Machini et al¹ who reported statistically significant relationship between family income and compliance with routine dental visits, with higher income patients making more frequent visits to their dentists.

Conclusion

Non-compliance is more common among male patients and patients above forty years. Also, the majority did not comply with routine visit to dentists. Dentists should lay more emphasis on post denture insertion instructions especially for male patients and the importance of routine dental visit.

References

1. Machini L, Tamashiro E, Nascimento DF, Cunha VP. Self-reported denture hygiene of a sample of edentulous attendees at a University dental clinic and the relationship to the condition of the oral tissues. *Gerodontology*. 2004; 21(4): 226 - 228
2. Kulak-Ozkan Y, Kazazoglu E, Arikan A. Oral hygiene habit, denture cleanliness, presence of yeast and stomatitis in elderly people. *J. Oral Rehabil*. 2002; 29(3): 300 -304
3. Ribeiro DG, Pavarina AC, Giampaolo ET, Machado AL, Jorge JH. Effect of oral hygiene education and motivation on removable partial denture wearers: longitudinal study. *Gerodontology*. 2009; 26 (2): 150 - 156.
4. Garrett A.A, Poor oral hygiene, wearing dentures at night, perceptions of mouth dryness and burning, and lower educational level may be related to oral malodor in denture wearers. *J. Evid Based Dent Pract*. 2010; 10(1): 67- 69.
5. Fenlon MK, Sherriff M, Walter JD. Factors associated with the presence of denture related stomatitis in complete denture wearers: a preliminary investigation. *Eur J Prosthodont Restorative Dent*. 1998; 6: 145 - 147.
6. Veeraiyan DN, Karthikeyan R, Vinaya B. *Textbook of Prosthodontics*. 4th ed. New Dehli, India: Jaypee Brothers Medical Publishers Ltd; 2003. p. 234.
7. Ogunrinde T.J, Opeodu O.I. Denture care practice among patients attending the prosthetic clinic in a Nigerian Teaching Hospital. *Niger Med J*. 2015; 56 (3): 199 -203
8. Shay K. Denture hygiene: a review and update. *J Contemp Dent Pract* 2000; 15: 28–41.
9. Sumi Y, Miura H, Sunarana M, Sakagami N. Colonization of denture plaque by respiratory pathogens in dependent elderly. *Gerodontology* 2002; 19: 25–29.
10. Addy M. Determination of relative dentifrice abrasivity to enamel and dentine by a surface profile method. *J Clin Dent*. 2010; 21: S13–S14.
11. Pascaretti-Grizon F, Mabilieu G and Chappard D. Abrasion of 6 dentrices measured by vertical scanning interference microscopy. *J Appl Oral Sci*. 2013; 21: 475 - 481
12. Razak PA, Richard KM, Thankanchan RP, Hafiz KA, Kumar KN, Sameer KM,. Geriatric Oral health: a review article. *J Int Oral Health*. 2014; 6: 110 - 116



13. Dikbas I, Koksall T, Calikkocaoglu S. Investigation of the cleanliness of dentures in a university hospital. *Int J Prosthodont* 2006; 19: 294-298
14. Takamiya AS, Monteiro DR, Baraõ VA, Pero AC, Compagnoni MA, Barbosa DB. Complete denture hygiene and nocturnal wearing habits among patients attending the Prosthodontic Department in a Dental University in Brazil. *Gerodontology*. 2011; 28; 91- 96.
15. Ogunrinde T.J, Dosumu O.O. The influence of demographic factors and medical condition on patients complaints with complete denture. *Ann Ibd. Pg. Med.* 2012; 10(2); 16-21
16. Jing J, Sklar EG, Sen-OH VM, Shu Chuen Li. Factors affecting therapeutic compliance: A review from the patient's perspective. *Ther Clin Risk Manag.* 2008; 4(1): 269- 286
17. Balbay O, Annakkaya AN, Arbak P, et al. Which patients are able to adhere to tuberculosis treatment? A study in a rural area in the northwest part of Turkey. *Jpn J Infect Dis.* 2005; 58: 152–158.
18. Murray MD, Darnell J, Weinberger M, et al. Factors contributing to medication noncompliance in elderly public housing tenants. *Drug Intell Clin Pharm.* 1986; 20: 146–152.