

OBTURATOR HYGIENE AMONG PATIENTS WITH MAXILLARY DEFECTS AT TWO TEACHING HOSPITALS IN GHANA.

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DOI: <https://dx.doi.org/10.4314/gdj.v20i1.7>

ABSTRACT

Background: An obturator may be defined as the component of a prosthesis that fits into and closes a defect within the oral cavity or other body defects. Cleaning one's obturator is essential to prevent offensive odour, poor aesthetics, the accumulation of plaques, and damage to both natural and prosthetic teeth due to bacteria contamination in the oral cavity.

Aim: The study aimed to determine how palatal obturator wearers practice good obturator cleaning habits.

Method: A cross-sectional study design was used for this study. A sample size of 40 palatal obturator wearers was used. Data was collected using a well-structured questionnaire. The questionnaire included demographic data (age, sex, educational level, occupation and years of wearing a prosthesis, obturator cleaning habits, obturator cleaning methods, and obturator wearing habits. The data were summarized using Descriptive statistics with tables and charts and analyzed using a chi-square test from Statistical Package for Social Sciences (SPSS version 22.0) and Microsoft Office Excel 2016 at p-value < 0.05.

Results: Sixteen (40%) of the total number were males, and 24(60%) were females giving a male-to-female ratio of 2:3. Twelve (30%) of the participants fell between the ages 31-40 years. Participants with tertiary education have better cleaning habits and knowledge of cleaning agents used. Fifteen (37.5%) participants who had worn a palatal obturator between 1-2 years frequently visited the dental clinic for a check-up; however, this number gradually decreased.

Conclusion: The majority of the patients evaluated had good clean habits with their prostheses and the cleaning agents used. However, participants with tertiary education had better prosthesis hygiene and maintenance methods.

Keywords: Palatal obturator, prosthetic, oral cavity, plaque, aesthetic

INTRODUCTION

An obturator may be defined as the component of a prosthesis that fits into and closes a defect within the oral cavity or other body defect¹. Cleaning one's obturator is essential to prevent offensive odour, poor aesthetics, the accumulation of plaques, and damage to both natural and prosthetic teeth due to bacteria contamination in the oral cavity². The physical nature of a palatal obturator is such that it can easily accommodate food debris which later forms dental plaques; this has been shown in a study by Takeuchi et al. in 2011 which revealed several bacterial species in the obturator. They concluded that the inner space of the obturator could act as a bacterial reservoir³. In addition, Depprich et al. (2008), in their study demonstrated that there was significantly less microbial contamination of titanium-based obturators compared to Polymethylmethacrylate (PMMA) or silicon-based obturators⁴. Dental plaque accumulates on all surfaces, both hard and soft, in the oral cavity, including palatal obturators. From the moment an individual is fitted with a palatal obturator, the important phase of dental hygiene after treatment begins⁵. When patients practice good dental hygiene, microbial plaque formation on palatal obturators, which may be harmful to the mucous membrane and general health, is prevented. This is why dental professionals must have current knowledge about the proper dental hygiene of a palatal obturator⁶. Clinical follow-up should include educating patients on obturator care, guidance regarding features of an ill-fitting obturator, and the need for replacing obturators after some years. This plays a major role in maintaining oral health and the long-term success of palatal obturator treatment⁷. It was reported that the quality of the obturator fitting surface, occlusal relations, and hygiene were important factors contributing to the prevalence of oral

mucosal lesions associated with using a palatal obturator⁸. Ideally, obturator care products should be easy to handle, provide a bactericidal and fungicidal action, and effectively remove organic or inorganic deposits and stains. They should also be non-toxic to the patient, cause no damage to the prosthesis constituents, and be cheap to purchase⁹⁻¹¹.

Unclean obturators result in oral mucosal diseases, impairment in eating, and a fall in self-esteem. Oral hygiene practice such as teeth cleaning (brushing) positively affects mastication, eating, swallowing, speech, facial aesthetics, and social interaction, thereby culminating in improved quality of life¹². Brushing is also the most common cleansing method for palatal obturators¹³.

Care of palatal obturators and the mucosal tissues of the edentulous mouth is important for overall health, especially in the elderly¹⁴. Surveys show that many patients fail to keep their palatal obturators clean and prefer to use dirty obturators^{15,16}.

This situation may result from clinicians' failure to recall their patients and reinforcing the palatal obturator hygiene methods¹⁷, lack of proper guidance by dentists, not following the dentist's recommendations, and the surface texture of the prosthesis^{9,18}.

Several studies have shown that proper obturator care is important for preventing oral infections that often result from bad oral hygiene and inadequate cleaning of palatal obturators¹⁹.

The study aimed to determine how palatal obturator wearers practice and maintain good cleaning obturator habits in Ghana

MATERIALS AND METHODS

The study was a cross-sectional conducted among 40 consenting participants of age 21 years and above living in the Accra metropolitan district in Ghana. The participants were palatal obturator wearers selected using a purposive sampling technique from the Maxillofacial Departments of Ridge Hospital and the Korle-Bu Teaching Hospital. They were requested to complete a well-structured questionnaire.

The questionnaires included demographics (age, sex, educational level, occupation, and years of wearing prostheses), obturator cleaning habits, obturator cleaning methods, and obturator wearing habits.

Ethical clearance was obtained from the Ethics and Protocol Review Committee of the School of Biomedical and Allied Health Sciences, University of Ghana (Reg.no. SBAHS-MLS./10515597/SA/2017-2018).

STATISTICAL ANALYSIS

Data was captured using Microsoft Access. Means and standard deviations were calculated for all quantitative variables. Categorical variables were summarized as proportions and percentages. Proportions and percentages were analyzed using the Chi-square test (at a significance level of $p < 0.05$) from the Statistical Package for Social Sciences (SPSS) version 22.

RESULTS

Out of forty (40) participants of palatal obturator wearers, 16 (40%) were males, and 24 (60%) were females giving a male-to-female ratio of 2:3. The mean age of the participants was 40.50 ± 9.57 years. Most participants, 12 (30%), fell between the ages of 31 and 40. The lowest number of participants, 7 (17.5%), were in the age group of 51-60 years, as indicated in Table 1.

Table 1 also indicates the number of years participants wore their palatal obturators; it also shows their level of education and occupation.

Table 1: Socio-demographic characteristics of participants

VARIABLES	FREQUENCY	PERCENTAGE 100%
Age		
21-30	11	27.5
31-40	12	30
41-50	10	25
51-60	7	17.5
Gender		
Male	16	40
Female	24	60
Occupation		
Office worker	6	15
Student	10	25
Health worker	8	20
Trader	9	22.5
Other	7	17.5
Educational level		
Primary	10	25
Secondary	7	17.5
Tertiary	23	57.5
Number of years wearing a palatal obturator		
1-2	15	37.5
2-3	5	12.5
3-4	6	15
4-5	9	22.5
6+	5	12.5

Figure 1 indicates difficulties participants encounter when eating with their obturator. 56.3% of male participants had difficulty eating while wearing the palatal obturator, and 43.8% did not have such difficulty. 58.3% of females had difficulty eating when wearing the palatal obturator, and 41.7% did not have the same difficulty.

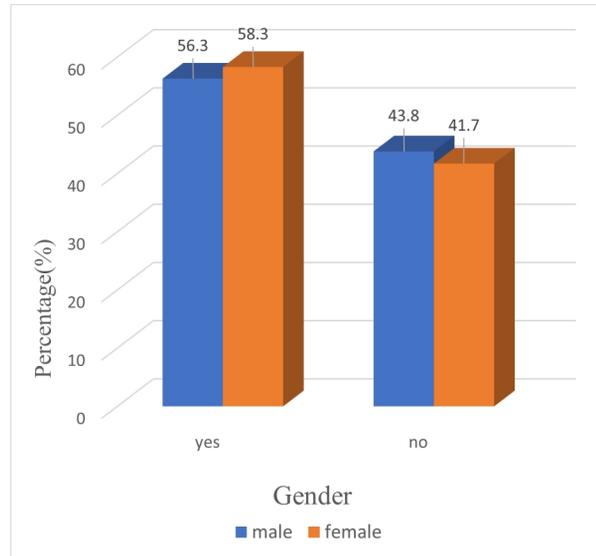


Figure 1: Difficulty eating in obturator wearers

Table 2 indicates the cleaning habits of participants in accordance with their level of education. 20% of participants with primary level education recorded the least percentage of cleaning their obturators twice daily, and 91.3% of participants with tertiary education recorded the highest.

Table 2: Participants' educational level and cleaning habits.

Educational level	How often is cleaning done		Total	P Value
	Once a day n (%)	Twice a day n (%)		
Primary	8 (80)	2(20)	10	<0.001
Secondary	4(57.1)	3(42.9)	7	
Tertiary	2(8.71)	21(91.3)	23	
Total	14(35)	26(65)	40	

Table 3 shows the percentages of patients using different cleaning agents for their prosthesis, with those at the tertiary level recording a greater percentage (47.8%) for using a prosthesis cleaning solution.

Table 3: Cleaning agents used by participants

Educational level	Cleaning agents used			Total n	P value
	Water+ toothbrush + toothpaste n (%)	Water+ toothbrush+ toothpaste+ soap n (%)	Prosthesis cleaning solution n (%)		
Primary	9(90)	1(10)	0	10	0.001
Secondary	6(87.5)	1(14.3)	0	7	
Tertiary	5(21.7)	7(30.4)	11(47.8)	23	
Total	20(50.0)	9(22.5)	11(27.5)	40	

Figure 2 indicates the number of years patients had worn an obturator and how frequently they attended dental clinics for check-ups.

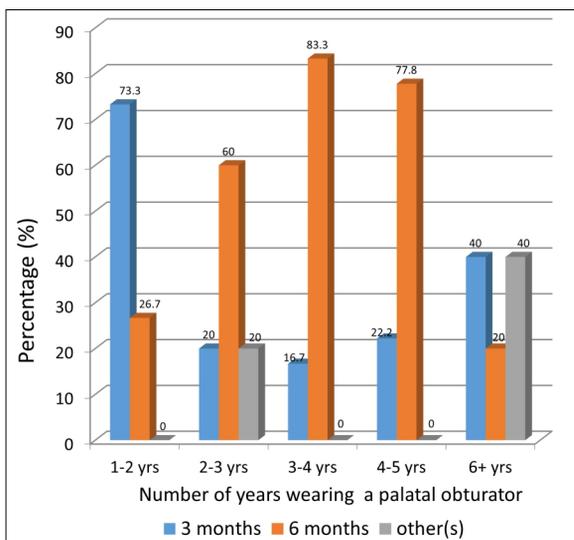


Figure 2: Duration of wearing obturator.

DISCUSSION

Cleaning one’s obturator is essential to prevent offensive odour, poor aesthetics, the accumulation of plaques, and damage to both natural and prosthetic teeth due to bacteria contamination in the oral cavity². Good cleaning habits are of great importance if a palatal obturator is to serve its purpose in the long term.

The study was conducted to provide information about how obturator wearers practice good obturator cleaning habits in two teaching hospitals, namely, the Maxillofacial Departments of Ridge Hospital and the Korle-Bu Teaching Hospital in Accra.

The demographics of 40 participants who received instructions on obturator cleaning are presented in Table 1. Of these numbers, 16 (40%) participants were males and 24 (60%) were females. This was similar to a study by

Depprich et al. in 2008²⁰ and Kreeft et al. in 2012²¹, where there was a predominance of females that is 54.8% and 59%, respectively. This may be attributed to more females with the condition being recruited for the survey. Regarding the age groups, a study by Depprich et al. (2008)²⁰ had majority of participants 13 (41.9%) between 60-69years²⁰. This was contradictory to the findings of this study. As indicated in Table 1, 23(57.5%) had completed tertiary education; according to Depprich’s study, a greater number, 17(54.7%) of participants had basic education only²⁰. This was contradictory to the findings of this study.

As indicated in Figure 1 in this study, 56.3% of males had difficulty eating and wearing the palatal obturator, while 43.8% did not face the same difficulty. 58.3% of females had difficulty in eating wearing the palatal obturator, while 41.7% did not face the same challenges. The majority of the participants had problems eating because of the obturator. This was similar to a study by Depprich et al. (2008)²⁰, Sampler et al. in 2019²², and Ozdemir-Karatas et al. (2018)²³. Their study revealed difficulties in eating, such as ingestion, nasal leaking, and retention of their obturators. This was attributed to larger defects or larger tumors. This was, however, contrary to a study conducted by Matsuyama et al. in 2005²⁴, where the swallowing ability of 38 patients was examined using the water drinking test when wearing an obturator prosthesis. It was found that the performance improved significantly when patients wore prostheses²⁴.

As indicated in Table 2, regarding the cleaning habits of participants, the majority of the participants, 91.3% with tertiary level education, practiced prosthesis cleaning twice a day, whereas 20% and 42.9% of participants with primary and secondary education level cleaned their prosthesis twice a day respectively. There was a significant association (p<0.05) between one’s educational level and prosthesis cleaning habits. The characteristics of the denture, the limited ability of the elderly, and the lack of education, among others, have been linked with poor denture hygiene in previous studies^{25,26}.

In ascertaining whether the educational level of participants had any influence on their choice of cleaning agents (Table 3), responses obtained indicated that the majority 90% of participants with primary education used water, toothbrush, and toothpaste as their cleansing agents, and 10% combined water, toothbrush, toothpaste and soap. In addition, 85.7% of participants with secondary education used water, toothbrush, and toothpaste, and 14.3% used water together with toothbrush, toothpaste, and soap. Also, a small number 21.7% of participants with tertiary education used water, toothbrush, or toothpaste as their cleaning agent, 30.4% used water, toothbrush, toothpaste, and soap, and while a more significant number, 47.8%, used prosthesis cleaning solution as their cleaning agent.

The most common cleaning methods of the dental prosthesis are brushing²⁷ with paste or soap^{28,29}, soaking in a household chemicals solution such as bleach or vinegar²⁹, dipping in a commercial aqueous denture cleaner³⁰, and the use an ultrasonic cleaning device^{31,32} to eliminate debris, stain, denture plaque, as well as neutralize offensive odors^{33,34}. It was observed that patients who completed tertiary-level education opted for the prosthesis cleaning solution demonstrating their awareness of advanced cleaning materials (hygiene methods). There was a significant association (p-value= 0.001) between educational level and the type of cleaning agent used.

The findings from the study regarding dental check-ups (Figure 2) indicated that a higher number of participants, 15(37.5%) who had worn palatal obturator within 1-2 years, frequently visited the dental clinic. This number generally decreased with the number of years wearing the obturator. This was compared favourably to a similar study by Dalkiz and Dalkiz(2018)³⁵, in which most patients visited the dental clinic more than once in the first three months but gradually declined to once every three months³⁵. This may be due to patients knowing how to clean their obturators better in the first two years, hence not visiting regularly. In a study by Ullah Khan et al. 2015³⁶, a patient with a replaced obturator that had used one prior, not less than 10 years, was set on a 6-month periodic recall visit for follow-up.

CONCLUSION

A greater number of the patients evaluated had good cleaning habits for their prosthesis; however, few did not give importance to proper prosthesis hygiene. Participants with tertiary education had better cleaning habits for their prostheses and the cleaning agent used. Most participants had difficulty eating while wearing the obturator. The majority of the participants visited the dental clinic for check-ups in the first two years, after which there was a gradual decline in the number of visits.

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