RESEARCH ARTICLE

INFLUENCE OF DEMOGRAPHIC VARIABLES ON DENTURE HYGIENE KNOWLEDGE AND PRACTICES AMONG PARTIAL AND COMPLETE DENTURE WEARERS

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ABSTRACT

Background: Continuous use of dentures requires regular hygiene maintenance, a task which is often neglected by the patients. The objective of this study was to assess the level of awareness/knowledge grade among partial and complete denture wearers regarding oral and denture hygiene maintenance, and to establish any association of this knowledge with different demographic variables including age, gender, socioeconomic status, education, and type of denture.

Materials and Methods: A cross-sectional survey was carried out through consented interviews using a self-designed close-ended questionnaire based on 9 relevant items. Afterwards, a simple numerical calculation was done to derive the final score, ranging from 0 upto 9, which was then used to categorize the knowledge grade into 5 groups: Extremely poor (score of 0 or 1); Relatively poor (score of 2 or 3); Moderate (score of 4 or 5); Relatively good (score of 6 or 7); and Extremely good (score of 8 or 9).

Results: A total of 112 patients were included, with a mean score of 4.92 ± 1.89. There were only 6 (5.4%) patients with extremely poor and 8 (7.1%) patients with extremely good knowledge grade. Almost 37% patients had moderate level of knowledge. Chi-square test remained highly significant for age groups (P<0.001), socio-economic status (P<0.001), education level (P=0.010) and type of denture (P<0.001). For gender, the test remained non-significant (P= 0.117).

Conclusions: Denture hygiene knowledge and practices of denture wearers is strongly related to demographic variables of age, socio-economic status, education level and the type of denture being worn.

INTRODUCTION

Removable partial or complete dentures are one of the most widely used replacement prostheses to restore the esthetic and functional requirements of the patients (Wendt, 1985; Peracini *et al.*, 2010). Continuous use of these dentures has to be supplemented by efficient and regular hygiene maintenance schedule. This not only warrants long-term success with dentures but also maintains the health of the oral mucosa (Goiato *et al.*, 2011). To this end, it is the responsibility of the dentist to cite appropriate denture and oral hygiene instructions to the patients, (Apratim *et al.*, 2013; Saha *et al.*, 2014) and reinforce the important points at regular follow-up appointments (Milward *et al.*, 2013). On one hand, it has been reported that many times the patients are not well-educated by their dentists whereas on the other hand, it has also been

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suggested by researchers that patients tend to forget the given instructions over a passage of time (De Castellucci Barbosa *et al.*, 2008; Barreiro *et al.*, 2009). In order to judge the level of awareness in denture wearers, the dentists must rely on periodic recalls to assess the effectiveness of oral and denture hygiene practices, and reinforce them if needed. Only in this way can the dentures provide a long term beneficial service to the patients (Milward *et al.*, 2013). The aim of the present study was also to assess the level of awareness/knowledge grade among partial and complete denture wearers regarding oral and denture hygiene maintenance, and to establish any association of this knowledge with different demographic variables including age, gender, socioeconomic status, education, and type of denture. This information would be used in developing and implementing specific hygiene instructions applicable to the local as well as regional patient populations.

MATERIALS AND METHODS

This cross-sectional survey was carried out in the Department of Prosthodontics at a private dental college from 1st March

2016 to 28th February 2017. Approval was obtained from the Ethical Review Committee of the institute to include equal number of removable partial and complete denture wearers within the study duration. The following selection criteria was used: both male and female patients within the age range of 26 to 85 years, patients wearing the concerned dentures for more than 6 months, and patients presenting with post-insertion complaints requiring adjustments to occlusion or denture base. Any patient who did not give consent, was mentally or physically handicapped, or experiencing xerostomia was not included in this study.

Data collection was carried out on the same performa used in a previous study.(Ahmad *et al.*, 2015) This questionnaire was printed in both English and Urdu languages, and was filled in a consented interview after addressing the presenting complaints of the patients. For this purpose, two demonstrators (one male and one female) were adequately briefed and trained by the primary author. The questionnaire included the following nine items:

1. Do you clean your denture after a meal?
2. Do you remove your denture before sleeping?
3. Whenever you remove your denture, do you keep it dipped in water?
4. Do you know you are supposed to clean your denture after every meal?
5. Do you use hand scrubbing for cleaning your denture?
6. Do you use denture cleaning brush in addition to hand scrubbing?
7. Do you use denture cleansing tablets for soaking your denture?
8. Do you know you are not supposed to use ordinary tooth paste for denture cleaning?
9. Do you know you are not supposed to apply any chemicals on your denture?

Patients were required to answer either as "Yes" or "No" to each of these questions. All questions were so designed that the ideal answer was a "Yes" to every statement.

After recording patient responses, a simple numeric calculation was used. Every "No" was given 0 point (value 1) and every "Yes" was given 1 point (value 2). Both values were added up to derive the final score of the patient, which ranged from minimum of 0 (all answers in "No") to a maximum of 9 (all answers in "Yes"). This final score was then used to categorize the knowledge grade of the patients into 5 groups: Extremely poor (score of 0 or 1); Relatively poor (score of 2 or 3); Moderate (score of 4 or 5); Relatively good (score of 6 or 7); and Extremely good (score of 8 or 9). Data analysis was performed with IBM SPSS software version 19. Different groups were devised for the various demographic variables: three groups for age (26-45 years as Group I, 46-65 years as Group II, 66-85 years as Group III); two for gender (males, females); three groups for socioeconomic status (fully affording, partially affording and non-affording); six groups for education level (illiterates, primary education, elementary education, matric, intermediate, and graduation or above); and two groups as per the denture type (Group C for complete denture and Group P for partial denture wearers).Mean age and mean score was computed with standard deviations. Correlations among the study variables were generated through cross tabulations and the Chi-square test was applied for significance (P value less than 0.05 was considered to be significant).

RESULTS

A total of 112 patients, with 56 each in Group C and Group P, were included within the study duration. The subjects ranged in age from 28 years upto 85 years with a mean age of 60.34 ± 12.37. There were 60 (53.6%) males and 52 (46.4%) females. On the basis of age, there were only 12 (10.7%) patients in Group I, 60 (53.6%) in Group II and 40 (35.7%) in Group III. On the basis of socio-economic status, 36 (32.1%) patients reported to be fully affording, 46 (41.1%) were partially affording while 30 (26.8%) were in the non-affording category. Among the study sample, 26 (23.2%) were illiterates, 20

Table 1. Distribution of Patients on the Basis of Knowledge Grade Devised from the Total Score

Knowledge Grade	Total Score	Frequency	Percentage	Total No. of Patients
Extremely Poor	0	Nil	Nil	6 (5.4%)
	1	6	5.4%	
Relatively Poor	2	4	3.6%	20 (17.9%)
	3	16	14.3%	
Moderate	4	20	17.9%	42 (37.5%)
	5	22	19.6%	
Relatively Good	6	20	17.9%	36 (32.1%)
	7	16	14.3%	
Extremely Good	8	4	3.6%	8 (7.1%)
	9	4	3.6%	

Table 2. Cross Tabulation of Knowledge Grade with the Type of Denture Worn by the Patients

Knowledge Grade	Complete Denture Wearers (Group C)	Partial Denture Wearers (Group P)
Extremely Poor	2 (1.8%)	4 (3.6%)
Relatively Poor	16 (14.3%)	4 (3.6%)
Moderate	16 (14.3%)	26 (23.2%)
Relatively Good	14 (12.5%)	22 (19.6%)
Extremely Good	8 (7.1%)	Nil

Table 3. Cross Tabulation of Knowledge Grade with Age Groups

Knowledge Grade	Group I (26-45y)	Group II (46-65y)	Group III (66-85y)
Extremely Poor	0	6 (5.4%)	0
Relatively Poor	2 (1.8%)	4 (3.6%)	14 (12.5%)
Moderate	6 (5.4%)	26 (23.2%)	10 (8.9%)
Relatively Good	4 (3.6%)	24 (21.4%)	8 (7.1%)
Extremely Good	0	0	8 (7.1%)
Total	12 (10.7%)	60 (53.6%)	40 (35.7%)

Table 4. Cross Tabulation of Knowledge Grade with Socio-economic Status

Knowledge Grade	Fully Affording	Partially Affording	Non-affording
Extremely Poor	2 (1.8%)	2 (1.8%)	2 (1.8%)
Relatively Poor	6 (5.4%)	4 (3.6%)	10 (8.9%)
Moderate	20 (17.9%)	10 (8.9%)	12 (10.7%)
Relatively Good	2 (1.8%)	28 (25.0%)	6 (5.4%)
Extremely Good	6 (5.4%)	2 (1.8%)	0
Total	36 (32.1%)	46 (41.1%)	30 (26.8%)

Table 5. Cross Tabulation of Knowledge Grade with Education Level

Knowledge Grade	Illiterate	Primary	Elemen-tary	Matric	Inter	Graduation
Extremely Poor	4 (3.6%)	0	2 (1.8%)	0	0	0
Relatively Poor	8 (7.1%)	2 (1.8%)	0	6 (5.4%)	2 (1.8%)	2 (1.8%)
Moderate	4 (3.6%)	6 (5.4%)	8 (7.1%)	8 (7.1%)	6 (5.4%)	10 (8.9%)
Relatively Good	8 (7.1%)	10 (8.9%)	8 (7.1%)	8 (7.1%)	2 (1.8%)	0
Extremely Good	2 (1.8%)	2 (1.8%)	0	2 (1.8%)	0	2 (1.8%)
Total	26 (23.2%)	20 (17.9%)	18 (16.1%)	24 (21.4%)	10 (8.9%)	14 (12.5%)

Table 6. Cross Tabulation of Knowledge Grade with Gender

Knowledge Grade	Males	Females
Extremely Poor	2 (1.8%)	4 (3.6%)
Relatively Poor	12 (10.7%)	8 (7.1%)
Moderate	28 (25.0%)	14 (12.5%)
Relatively Good	14 (12.5%)	22 (19.6%)
Extremely Good	4 (3.6%)	4 (3.6%)
Total	60 (53.6%)	52 (46.4%)

(17.9%) were having upto primary level of education, 18 (16.1%) had elementary education, 24 (21.4%) upto matriculation, 10 (8.9%) with intermediate and 14 (12.5%) had graduation or above level of education. The responses to individual questions asked in the performarevelaed that 80 (71.4%) patients knew they were supposed to clean their dentures after a meal, 64 (57.1%) knew about removing the dentures before sleeping, 82 (73.2%) patients knew about soaking the dentures in water while they were removed, 82 (73.2%) patients knew they had to clean their dentures after every meal, 66 (58.9%) knew about hand scrubbing the denture for hygiene maintenance, 84 (75.0%) knew about using hand scrubbing along with a denture cleaning brush, only 4 (3.6%) patients knew about denture cleansing tablets, 26 (23.2%) patients knew about not using the ordinary tooth paste for denture cleaning, and 58 (51.8%) patients knew about not applying any chemicals on the denture for any purpose. Total score, derived through numerical calculation, ranged from minimum of 1 to maximum of 9, with a mean score of 4.92 ± 1.89. No patient obtained zero in the calculation. A detailed

view of the score and the correlated knowledge grades is presented in Table No. 1. Table No. 2 presents the distribution of patients on the basis of knowledge grade and the type of denture worn by the patients. Out of the 6 (5.4%) patients in the extremely poor category (score of 0 or 1), 2 were complete denture wearers and 4 were partial denture wearers. On the other end, the extremely good category (score of 8 or 9) was presented by 8 (7.1%) patients only, all of whom were complete denture wearers. Chi-square test was applied among the study variables to determine their level of significance. The test revealed a highly significant association of knowledge grade with age groups (P value less than 0.001), socio-economic status (P value less than 0.001), education level (P value 0.010) and type of denture (P value less than 0.001). For gender, the test remained non-significant (P value 0.117). Tables 3 to 6 present the detailed views of knowledge grade with the above mentioned variables.

DISCUSSION

Over the course of 1 year, a total of 112 patients were enrolled in the study. In order to maintain uniformity between both study groups, equal number of patients (56 each) were included in Group C and Group P. The type of prosthesis worn by the patients had a significant association with knowledge grade since the 8 patients exhibiting the extremely good knowledge grade were all complete denture wearers. No partial denture patient was able to score high enough, which may be an indication that they either do not get proper instructions regarding hygiene maintenance from the dentists or denturists, or they tend to neglect their prosthesis hygiene more often than the complete denture wearers. This aspect may be studied further to have a better understanding of this finding. There were also almost equal number of males and females in the study sample. However there was no statistically significant difference among them regarding denture hygiene knowledge and practices. On the basis of the age groups devised, there were only 12 (10.7%) patients in the relatively younger aged Group I which may have been because the department of prosthodontics mainly deals with middle to old aged patients who need replacements for missing teeth, a condition less commonly presented in the younger patients. This disparity in distribution of patients among the age groups may have influenced the highly significant outcome of statistical analysis. This aspect may need more controlled studies in future for more accurate outcome.

Socio-economic status was judged according to the ability of the patients to afford a proposed treatment. Hence three groups were formulated from fully affording to partially affording to non-affording people without going into the details of their monthly income. And very interestingly, there were 30 or more patients in these three study groups. The highly significant association of knowledge grade with socio-economic status seems to be legitimate by all means, as only the fully and partially affording patients scored in the extremely good category of knowledge grade which was somewhat expected. Patients were also subdivided into 6 groups on the basis of their reported formal school or college based education. A total of 48 patients had matriculation or above level of education, which was in itself a noteworthy finding as it was slightly less than half of the patient sample. Chi-square test revealed a significant difference with this variable since the extremely poor category of knowledge grade was not demonstrated by any patient having matriculation or above level of education.

Data collection was carried out on a questionnaire with 9 different items which were to be answered as "Yes" or "No" by the patients. This was done to keep the data collection relatively simple and easy to perform in a clinical sitting without taking up any extra time of the patients. Of concern is the fact that only about 57% of the subjects knew about removing dentures before sleeping, which is a very basic instruction cited by dentists to all denture patients. It was also an attention-grabbing finding that only 4 (3.6%) patients knew about using denture cleansing tablets for hygiene maintenance.

In a previous study, it was found that a very low percentage of the study group used the denture cleansing tablets.(Ahmad *et al.*, 2015) Perhaps in this part of the world, access to such dental care products is still limited and many a times the dentists themselves are not aware of this useful product or they fail to properly instruct the patients in this regard. This aspect may be taken up in future research. Chhabra (Chhabra *et al.*, 2015) stated that the behavior and knowledge of denture wearers towards hygiene maintenance needs to be improved. For this, they have emphasized on making coordinated efforts by specialists and general dental practitioners to impart and improve hygiene related education and knowledge of denture patients. A recent study (Cakan *et al.*, 2015) found positive association of denture hygiene practices with gender but not with education level of the patients. They also found that almost 53% patients did not remove dentures before sleeping while in our sample about 43% had the same practice. This clearly shows that patients generally tend to neglect oral and denture hygiene measures and mayinfact overlook cited instructions by the dentists. Therefore dentists should inform the patients about the possible harmful effects of neglecting proper hygiene procedures and motivate them towards this important task. A previous study (Ahmad *et al.*, 2015) also found denture hygiene knowledge and practices to be better among the more literate people and also better among complete denture wearers. A similar trend was noted in the present study. Therefore efforts must be made to impart better knowledge and training to the less literate and to partial denture patients to improve their attitudes and practices towards hygiene maintenance.

It has also been reported that relatively poor condition of complete dentures was mainly due to irregular cleansing habits and also due to less usage of denture cleansing solutions (Saha *et al.*, 2014). In the present study, the overall condition of the dentures was not recorded. However, it was found that only a fraction of the patients knew or used cleansing solutions for hygiene maintenance. In their study on the awareness among dental professionals regarding the use of denture cleansers, it was found that even the dentists themselves had inadequate knowledge about the use and adverse effects of these solutions. It was recommended that dentists should be provided adequate level of knowledge and training about the use of these products so that they can impart better guidance to their denture patients (Pasricha *et al.*, 2014).

Conclusion

Within the limitations of the present study, it can be concluded that denture hygiene knowledge and practices of denture wearers was strongly related to different demographic variables, including age (elderly patients being better than middle aged ones), socio-economic status (fully and partially affording lot being better than the non-affording ones),

education level (more literate subjects being better than the less literate ones) and the type of denture (complete denture wearers better than the partial denture wearers). However, knowledge grade of the patients may not be related to their gender.

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