Acta Scientiarum

http://www.uem.br/acta
ISSN printed: 1679-9291
ISSN on-line: 1807-8648
Doi: 10.4025/actascihealthsci.v37i1.24512

Effects of hygiene guidance associated or not to provision of hygiene devices on habits of denture wearers

Fernanda Ferruzzi[1*], Júlio César Leonard Sabzack Martins[2], Giovani Oliveira Corrêa[3], Eduardo Kurihara[2] and Sérgio Sábio[2]

*[1]Faculdade de Odontologia de Bauru, Universidade de São Paulo, Alameda Octávio Pinheiro Brisola, 9-75, 17012-901, Bauru, São Paulo, Brazil. [2]Universidade Estadual de Maringá, Maringá, Paraná, Brazil. [3]Universidade Estadual de Londrina, Londrina, Paraná, Brazil. *Author for correspondence. E-mail: fer.ferruzzi@gmail.com*

ABSTRACT. Appropriate hygiene of dentures contributes to the maintenance of oral and systemic health. However, most of denture wearers had never been instructed on how to perform daily oral/denture care. The purpose of this study is to investigate the influence of a guidance material associated or not to the provision of hygiene devices and its effect on the habits of denture wearers. Forty- eight complete denture wearers were randomly divided into three groups. Group N received no guidance on how to clean and wear their dentures, group G received an illustrated leaflet and verbal complementary instructions and group GK received the same guidance as group G and a hygiene kit for denture cleaning. After a six to ten week period they responded to a 'hygiene and wearing habits' questionnaire. Chi-square test was used for statistical analysis considering $p < 0.05$. Brushing was the most frequent cleaning method, the majority of groups N and G used toothpaste. Participants of group G and GK presented low percentages of individuals with hygiene and wearing routine considered improper. The differences between groups in hygiene and wearing routine were statistically significant ($p < 0.001$). The proposed guidance material yielded better results when associated to provision of hygiene devices for denture cleaning.

Keywords: oral hygiene, oral health, health education.

Influência da orientação associada ou não à distribuição de dispositivos de higiene nos hábitos de portadores de próteses totais

RESUMO. O objetivo deste estudo é investigar a influência de um material de orientação de higiene, associado ou não à distribuição de dispositivos de higiene, nos hábitos de portadores de próteses totais. Quarenta e oito voluntários foram divididos em três grupos. O grupo N não recebeu orientação sobre higienização de próteses. O grupo G recebeu um folheto ilustrado e orientações verbais. O grupo GK recebeu orientações similares as do grupo G e um conjunto de dispositivos para higiene de próteses. Após seis a dez semanas, os voluntários responderam um questionário sobre hábitos de higiene e uso das próteses. A análise estatística foi realizada através do teste qui- quadrado, considerando $p < 0.05$. A escovação foi o método de higienização mais utilizado, e a maioria dos voluntários dos grupos N e G utilizaram creme dental. Um baixo percentual de participantes do grupo G e GK apresentaram uma rotina de higienização e uso considerada imprópria. Houve diferença estatisticamente significante entre os grupos para a rotina de higienização e uso ($p < 0,001$). O material de orientação de higiene proposto neste estudo apresentou melhores resultados quando associado à distribuição de dispositivos de higiene.

Palavras-chave: higiene oral, saúde oral, educação em saúde.

Introduction

Preventive dentistry and health promotion were responsible for improvements in people's oral health and higher tooth retention rates. However, complete loss of natural teeth is still widespread and particularly affects older people. According to World Health Organization (2012) about 30% of people aged 65-74 have no natural teeth and in dental practice, it is often seen that the majority of edentulous patients are elderly. Therefore, it is hard to dissociate elderly people from denture wearers.

Complete or partial dentures are susceptible to biofilm accumulation, which can cause stains, malodor, stomatitis and oral candidiasis as well as periodontal disease and caries in remaining teeth (BARAN; NAÇALCI, 2009). Proper denture cleaning reduces the number of microorganisms on the surface of the prosthesis and oral mucosa, increasing the buffer capacity of saliva

(MAHONEN et al., 1998) and contributes to the maintenance of oral and systemic health (FELTON et al., 2009).

When edentulous patients are fitted with complete dentures, they must receive guidance on denture cleaning, nocturnal wear, the importance of follow up visits and the possible need for adjustments and rebasing. However, studies report that most of denture wearers do not clean their dentures properly; many of them had never been instructed on how to perform daily oral/denture care (KULAK-OZKAN et al., 2002; MARCHINI et al., 2004; DIKBAS et al., 2006; BARBOSA et al., 2008; PERACINI et al., 2010; TAKAMIYA et al.; 2010).

Health promotion activities can be helpful in improving the oral health of denture wearers, since they can encourage adults and seniors in being proactive in regards to their health (MARIÑO et al., 2004) and more responsible for their well-being. Despite the increasing concern in offering quality of life to the elderly (MCGRATH et al., 2009), there are few reports about health promotion activities targeted to this population (BAAT et al., 1993). This is also true for denture wearers so that most of them have advanced age.

We can appeal to several approaches to provide guidance and motivation in oral hygiene. Verbal instruction, illustrated leaflets, demonstrations and periodic follow-up visits yielded positive results. There is no evidence that supplying hygiene devices could increase the adaptation of individuals to a new oral care routine.

Noticing the importance of providing adequate guidance on denture care, the purpose of this research is to investigate the influence of a guidance material, associated or not to provision of hygiene devices, in habits of denture wearers. The null hypothesis is that there is no difference in hygiene and wearing routines among individuals who received guidance, guidance associated to hygiene devices and those who received no guidance.

Material and methods

After signing an Informed Consent, fifty-two patients from Maringá State University Dental Clinic participated as volunteers. All subjects attended in a health program called 'Oral Rehabilitation of Patients with Complete and Partial Edentulism' from May to September 2012 were invited to participate. In this health program, they had new complete dentures manufactured by undergraduate students supervised by a professor. All subjects must be maxillary or mandibular complete denture wearers for at least five years, non-institutionalized and independent enough to realize the daily oral hygiene by themselves. The participants must be capable of understanding the guidance proposed and answer the questionnaires. Thus, they responded by taking the Mini Mental State Exam (MMSE), a simplified scored exam of the cognitive mental status (FOLSTEIN et al., 1975). Unfortunately, four individuals presented impairment of cognitive ability and were not included in the study.

The capable subjects were randomly divided into three groups. At the day of the installation of their new dentures, subjects of Group N / No guidance (n = 17) were advised to continue cleaning and wearing their dentures as they used to do. Group G / Guidance (n = 15) received an illustrated leaflet (Figure 1) and complementary verbal instructions about wearing habits and hygiene care of complete dentures. Subjects of Group GK/ Guidance + Hygiene Kit (n = 16) received the same leaflet and instructions of group G and also received a hygiene kit containing a recipient for immersion of dentures, recipient for storing the sodium hypochlorite solution and a denture brush.

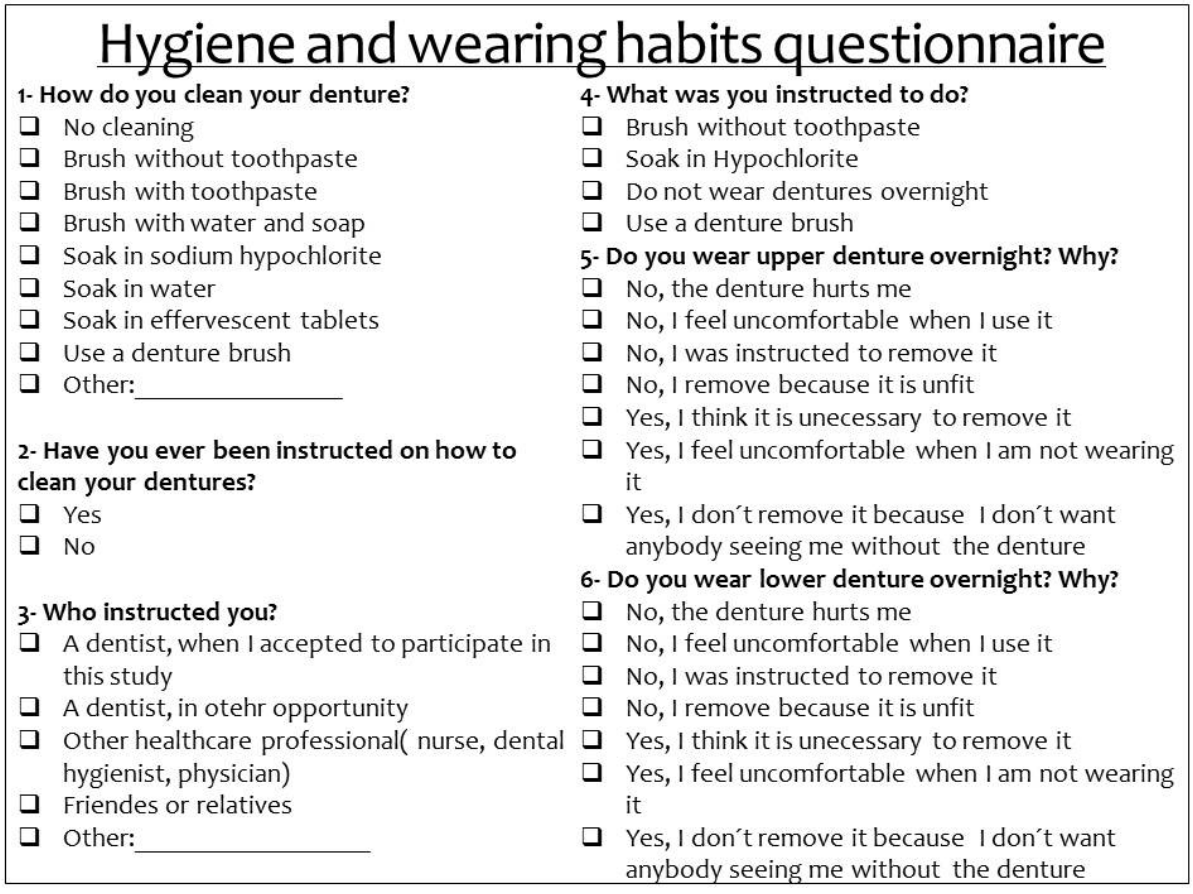
Figure 1. Illustrated leaflet.

The leaflet contained recommendations based on a literary review and guidelines of the American College of Prosthodontists (ACP) (FELTON et al., 2009). These guidelines suggest that patients should clean

dentures daily by soaking and brushing with a non-abrasive product. Although ACP does not suggest a specific product for soaking dentures, they report the use of sodium hypochlorite for periods no longer than 10 min. In vitro studies reported that a 10 min. immersion in a solution of 0.5% (VIEIRA et al., 2010) or 1% sodium hypochlorite (ORSI et al., 2011) were efficient for denture disinfection. Removing dentures at night is also recommended, since inflammatory fibrous hyperplasia and higher salivary levels of *Candida sp* are strongly related to nocturnal denture wear (COMPAGNONI et al., 2007; BARAN; NAÇALCI, 2009).

Although there is no evidence that any denture cleaning method is more beneficial for the health of denture bearing areas or patients' satisfaction and preference when compared with another (SOUZA et al., 2009); in the present study we suggested to participants to brush their dentures without toothpaste and soak dentures in household bleach and water blended in a 1:1 ratio. Considering household bleach is a dilution of 2% sodium hypochlorite and that storage conditions influence the sodium hypochlorite concentration (due to evaporation of part of chlorine gas) we suggested this ratio to ensure we could obtain a concentration of 0.5 to 1%. We also suggested that using a denture brush could help participants to reach difficult denture areas. So, the leaflet contained the following main guidelines: (1) brush your dentures without toothpaste; (2) use a denture brush; (3) Soak the dentures in a mixture of equal amounts of water and household bleach for 10 min.; (4) Remove both dentures at night.

After a six to ten week period the participants were interviewed about socioeconomic aspects such as gender, age, income and education. Data was collected about the types of dentures in each arch (complete or partial) and time of edentulism. They were also asked about denture hygiene and wearing routine using a questionnaire especially developed for this study (Figure 2). A second research assistant conducted the interview to avoid the embarrassment of the subjects who had not followed the guidelines provided by the first research assistant. The second research assistant was blind about the allocation of subjects in groups, to avoid the risk of bias. The interviewer tried to collect the first spontaneous answer; if the answers did not fit the alternatives in the questionnaire, the subjects were encouraged to choose one or more of the given options.



Hygiene and wearing habits questionnaire

1- How do you clean your denture?
- ❑ No cleaning
- ❑ Brush without toothpaste
- ❑ Brush with toothpaste
- ❑ Brush with water and soap
- ❑ Soak in sodium hypochlorite
- ❑ Soak in water
- ❑ Soak in effervescent tablets
- ❑ Use a denture brush
- ❑ Other:_____

2- Have you ever been instructed on how to clean your dentures?
- ❑ Yes
- ❑ No

3- Who instructed you?
- ❑ A dentist, when I accepted to participate in this study
- ❑ A dentist, in otehr opportunity
- ❑ Other healthcare professional(nurse, dental hygienist, physician)
- ❑ Friendes or relatives
- ❑ Other:_____

4- What was you instructed to do?
- ❑ Brush without toothpaste
- ❑ Soak in Hypochlorite
- ❑ Do not wear dentures overnight
- ❑ Use a denture brush

5- Do you wear upper denture overnight? Why?
- ❑ No, the denture hurts me
- ❑ No, I feel uncomfortable when I use it
- ❑ No, I was instructed to remove it
- ❑ No, I remove because it is unfit
- ❑ Yes, I think it is unecessary to remove it
- ❑ Yes, I feel uncomfortable when I am not wearing it
- ❑ Yes, I don´t remove it because I don´t want anybody seeing me without the denture

6- Do you wear lower denture overnight? Why?
- ❑ No, the denture hurts me
- ❑ No, I feel uncomfortable when I use it
- ❑ No, I was instructed to remove it
- ❑ No, I remove because it is unfit
- ❑ Yes, I think it is unecessary to remove it
- ❑ Yes, I feel uncomfortable when I am not wearing it
- ❑ Yes, I don´t remove it because I don´t want anybody seeing me without the denture

Figure 2. Hygiene and wearing habits questionnaire.

At the end of the interview the subjects of group N received the leaflet and the complementary instructions; and the same instructions were re-emphasized for the subjects of other groups. This experimental design was approved by University of Maringá's Research Ethics Committee (Process #0290.0.093.000-11).

The denture care routine was classified accordingly to four categories. Subjects who wore dentures overnight and cleaned them differently from the guidelines provided fell into the category 'improper'. Subjects who performed one of the presented guidelines fell into the category 'regular'. Subjects who performed two of the presented guidelines fell into the category 'acceptable'. The category 'proper' was assigned to subjects who performed denture care routine accordingly to three or more of the presented instructions.

Chi-square test was performed using the software IBM® SPSS Statistics® (IBM Corporation®). A level of $p < 0.05$ was considered statistically significant.

Results and discussion

Four participants did not attend for the interview, two being from group G and two from group GK. One of them was sick and the other three did not answer the phone calls. Data was collected from forty-four respondents, 22.7 male and 77.3% female. Most of them (38.6%) were 61 to 70 years old. 65.9% wore complete dentures for over 30 years, only 2.3% of volunteers wore both partial and complete dentures. 65.9% of them had an income of approximately US$ 340, equivalent to Brazil´s minimum wage. 79.5% did not complete primary school and 29.5% have never attended regular education. Data is shown in Table 1.

52.9% of participants from group N reported they received guidance on denture cleaning, meaning it happened previously to this study. Usually, the majority of patients had never been oriented on denture cleansing (MARCHINI et al., 2004; PERACINI et al., 2010). Even when they received some guidance, they were not oriented about other aspects such as oral care, nocturnal removal of dentures and the importance of periodic dental check-ups and the need for adjusting or rebasing.

Brushing with toothpaste was the most frequent cleaning method for groups N and G: 88.2 and 84.6%, respectively. In group GK, only 42.86% used toothpaste. This data is according to previous studies (MARCHINI et al., 2004, BARBOSA et al., 2008; BARAN; NAÇALCI, 2009; TAKAMIYA et al., 2010; PERACINI et al., 2010), which investigated habits of denture wearers. Brushing is probably most frequent due to easy accessibility, simplicity and low cost. Besides, in group GK it seems the individuals adhered to the guidance provided. Although brushing with toothpaste was highly prevalent (42,9%), brushing without toothpaste and with soap were more frequent (57,1%).

Table 1. Socioeconomic aspects by groups.

		N	G	GK	Total
Gender	Male	2 (11,8%)	4 (30,8%)	4 (28,6%)	10 (22,7%)
	Female	15 (88,2%)	9 (69,2%)	10 (71,4%)	3 (77,3%)
Age	31 to 40 years	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
	41 to 50 years	0 (0,0%)	2 (15,4%)	1 (7,1%)	3 (6,8%)
	51 to 60 years	5 (29,4%)	4 (30,7%)	4 (28,6%)	13 (29,6%)
	61 to 70 years	8 (47%)	2 (15,4%)	7 (50%)	17 (38,6%)
	Over 70 years	4 (23,6%)	5 (38,5%)	2 (14,3%)	11 (25%)
Income	Minimum wage (US$)340	14 (82,4%)	8 (61,5%)	7 (50%)	29 (65,9%)
	1 to 3 minimum wages	3 (17,6%)	5 (38,5%)	7 (50%)	15 (34,1%)
	3 to 5 minimum wages	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
	Over 5 minimum wages	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
Education	Illiterate	4 (23,5%)	7 (53,9%)	2 (14,3%)	13 (29,5%)
	Incomplete primary education	12 (70,6%)	4 (30,7%)	6 (42,9%)	22 (50,%)
	Primary education	0 (0,0%)	2 (15,4%)	3 (21,4%)	5 (11,4%)
	High school	0 (0,0%)	0 (0,0%)	3 (21,4%)	3 (6,8%)
	Higher education	1 (5,9%)	0 (0,0%)	0 (0,0%)	1 (2,3%)
Type of denture		17 (100%)	13 (100%)	14 (100%)	44 (100%)
	Maxillary complete denture	12 (70,6%)	11 (84,6%)	14 (100%)	37 (84,1%)
		0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
	Maxillary partial denture	0 (0,0%)	1 (7,7%)	0 (0,0%)	1 (2,3%)
Time of edentulism	Under 10 years	1 (5,9%)	2 (15,4%)	2 (14,3%)	5 (11,4%)
	10 to 20 years	1 (5,9%)	0 (0,0%)	1 (7,1%)	2 (4,5%)
	20 to 30 years	2 (11,7%)	4 (30,8%)	2 (14,3%)	8 (18,2%)
	Over 30 years	13 (76,4%)	7 (53,8%)	9 (64,3%)	29 (65,9%)

For chemical cleaning, the most frequent solution was sodium hypochlorite. This outcome is according to Marchini et al. (2004), Barbosa et al. (2008) e Takamiya et al. (2010), while in other studies (KULAK-OZKAN, 2002; BARAN; NAÇALCI, 2009; PERACINI et al. 2010) immersion in water was more frequent. Sodium hypochlorite is often utilized due to its low cost, easy handling and also for being an accessible solution in comparison to commercial chemical cleaners, since it is a domestic product with well-known disinfecting and whitening properties. Other cleaning methods reported in group N were immersion in vinegar and immersion in a sodium bicarbonate solution. Details are shown in Figure 3.

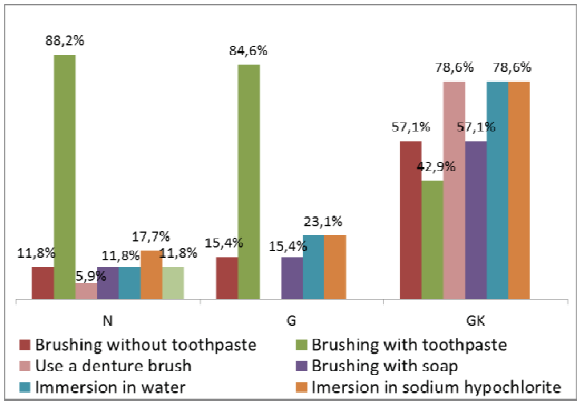


Figure 3. Cleaning methods by groups.

In group N, 23.5% removed the maxillary denture and 47.1% removed mandibular denture at night. In group G, 53.8% removed the maxillary denture and 66.67% removed the mandibular at night. In group GK, 57.1% removed the maxillary denture and 71.4% removed mandibular denture. Although there was no statistical difference among groups, we can notice a higher frequency of individuals removing the dentures at night in groups G and GK than in group N (Table 2).

Table 2. Nocturnal wear of maxillary and mandibular denture by groups.

		Group			Total
		N	G	GK	
Mandibular denture	Don´t wear	8 (50,0%)	8(66,7%)	10(71,4%)	26(61,9%)
	Wear	8 (50,0%)	4(33,3%)	4(28,6%)	16(38,1%)
Maxillary denture	Don´t wear	4(23,5%)	7(53,8%)	8(57,1%)	19(43,2%)
	Wear	13 (76,5%)	6(46,2%)	6(42,9%)	25(56,8%)

Chi- square test showed p = 0.446 for mandibular denture and p = 0.111 for maxillary denture.

Hygiene and wearing routine data is shown in Table 3. There was no statistically significant correlation between hygiene and wearing routine and the variables of gender, age, income, education, type of denture and time of edentulism. However, chi-squared test showed statistical difference for the hygiene and wearing routine among groups (p = 0,001).

Although chi-square test could not show which group presents better hygiene and wearing routine, numeric data allows us to interpret this outcome (Table 2). Most individuals who did not received guidance in this study (group N) fell in the category 'improper' and few of them who presented a hygiene and wearing routine considered 'proper'.

In group G, we observed a more equal distribution among categories 'improper', 'regular' and 'acceptable' but a small number of individuals cleaned and used their prostheses in a 'proper' way.

Table 3. Hygiene and wearing routine by groups.

	Group			Total
	N	G	GK	
Improper	12(70,6%)	5(38,5%)	1(7,1%)	18(40,9%)
Regular	2(11,8%)	4(30,8%)	3(21,4%)	9(20,5%)
Acceptable	1(5,9%)	3(23,1%)	1(7,1%)	5(11,4%)
Proper	2(11,8%)	1(7,7%)	9(64,3%)	12(27,3%)

Chi- square test showed p < 0.001.

Besides, in group GK, the majority of individuals fell into the category 'proper'. This outcome indicates that supplying hygiene devices might encourage the individuals to adhere to the proposed hygiene and wearing routine. Keep the solution of sodium hypochlorite previously proportioned in a sealed container and have a suitable container for the immersion of the denture (non-transparent with lid) may encourage the individuals to perform the chemical cleaning more frequently. Denture brush was not frequent for groups N (5.9%) and G (0.0%), but was commonly used by individuals of group GK. It suggests that obtaining denture brushes can be difficult, since they might not be available in pharmacies or supermarkets and they are expensive for a minimum wage population. These devices can facilitate brushing due to their design, especially for aged individuals, who often present poor manual dexterity.

In summary, groups that received guidance presented fewer individuals with an 'improper' hygiene and wearing routine. This finding corroborate with studies which observed improvement in several fields after oral health promotion activities targeted to the elderly or denture wearers (MARIÑO et al., 2004; PARANHOS et al., 2007; MCGRATH et al., 2009;

RIBEIRO et al., 2009; KOMULAINEN et al.; 2015). None of these studies evaluated the influence of provision of hygiene devices. The review of Baat et al. (1993) listed two studies with negative results, however they did not include personal contact with the individuals or chose a sample that could not benefit the proposed approach. In this experimental design we aimed to avoid any cognitive impairment of the participants that could influence the results by applying MMSE questionnaire when selecting participants. MMSE is a validated method to evaluate cognitive ability (FOLSTEIN et al., 1975). Composed by eleven questions, it requires 5-10 min. to administer, what is especially useful for elderly people with some cognitive impairment, who generally only cooperate for short periods. Based on the validity and reliability of this exam, we can consider that this sample is very independent and able to benefit from this health promotion activity.

Weinman (1990) highlights the written information material must be appropriate to its audience, taking into account the abilities and limitations of its readers. In this study, the guidance material contained colored images, objective and short phrases printed with a visible font; helping dentists and dental hygienists to communicate with patients.

The hygiene and wearing guidance were carried out in a unique session. Maybe, performing several sessions should lead to more expressive outcomes.

The period for evaluation was established empirically. Since there is no consensus regarding this aspect, we believe that if the questionnaire was applied after a short time from guidance, we could have had a promising but false result. In other words, the individuals should easily remember the recommendations of the hygiene guidance but not necessarily perform hygiene accordingly. On the other hand, if the questionnaire was applied after a longer period we were afraid of facing higher a drop-out rate. So, we decided to evaluate in a period between 6 to 10 weeks.

Data was obtained by an interview, as elderly individuals could have difficulty in answering a questionnaire. The questionnaire was especially developed for this study design, due to the lack of a validated questionnaire which could answer our research questions. Nevertheless, as well as any questionnaire-based study, we depend on the veracity of the participants´ answers, what can be considered a limitation.

We must also point out that this study used a convenience and small size sample, due to difficulty of selecting appropriate controls; therefore, data was submitted to statistical analysis as a transversal study. For these reasons we cannot extrapolate these outcomes for other populations.

On the other hand, there is no similar study assessing the role of guidance materials associated to hygiene devices on habits of denture wearers. Despite the limitations, the present study establishes adequate guidance as well as an easy, quick material for patients and practical for clinicians. Moreover, we want to bring up the importance of hygiene guidance and show it can make the difference in our patients' oral health.

Conclusion

Considering the limits of this study, we concluded that the health promotion activity improved hygiene and wearing routine of complete denture wearers. The proposed guidance material yielded better results when associated to provision of hygiene devices which could help denture cleaning. Further research is necessary on longer hygiene guidance programs and long term evaluation.

Acknoledgements

The authors thank Capes for financial support and Ms. Gabriela Santin for statistical analysis.

References

BAAT, C.; KALK, W.; SCHUIL, G. R. E. The effectiveness of oral hygiene programs for elderly people - A review. **Gerodontology**, v. 10, n. 2, p. 109-113, 1993.

BARAN, I.; NALÇACI, R. Self-reported denture hygiene habits and oral tissue conditions of complete denture wearers. **Archives of Gerontology and Geriatrics**, v. 49, n. 2, p. 237-241, 2009.

BARBOSA, L. C.; FERREIRA, M. R. M.; CARVALHO, C. F. Edentulous patients' knowledge of dental hygiene and care of prostheses. **Gerodontology**, v. 25, n. 2, p. 99-106, 2008.

COMPAGNONI, M. A.; SOUZA, R. F.; MARRA, J.; PERO, A. C.; BARBOSA, B. P. Relationship between *Candida* and nocturnal denture wear: quantitative study. **Journal of Oral Rehabilitation**, v. 34, n. x, p. 600-605, 2007.

DIKBAS, I.; KOKSAL, T.; CALIKKOCAOGLU, S. Investigation of the cleanliness of dentures in a university hospital. **International Journal Prosthodontics**, v. 19, n. 3, p. 294-298, 2006.

FELTON, D.; COOPER, L.; DUQUM, I.; MINSLEY, G.; GUCKES, A.; HAUG, S.; MEREDITH, P.; SOLIE, C.; AVERY, D.; CHANDLER, N. D. Evidence-based guidelines for the care and maintenance of complete dentures: a publication of the American College of Prosthodontists. **Journal of Prosthodontics**, v. 20, n. 1, p. 1-12, 2009.

FOLSTEIN, M. F.; FOLSTEIN, S. E.; MCHUGH, P. R. "Mini-mental state"- practical method for grading the cognitive state of patients for the clinician. **Journal of Psychiatric Research**, v. 12, n. 3, p. 189-198, 1975.

KOMULAINEN, K.; YLOSTALO, P.; SYRJALA, A.; RUOPPI, P.; KNUUTTILA, M.; SULKAVA, R.; HARTIKAINEN, S. Oral health intervention among community-dwelling older ; people: a randomised 2-year intervention study. **Gerodontology**, v. 32, n. 1, p. 62-72, 2015.

KULAK-OZKAN, Y.; KAZAZOGLU, E.; ARIKAN, A. Oral hygiene habits, denture cleanliness, presence of yeasts and stomatitis in elderly people. **Journal of Oral Rehabilitation**, v. 29, n. 3, p. 300- 304, 2002.

MAHONEN, K.; VIRTANEN, K.; LARMAS, M. The effect of prosthesis disinfection on salivary microbial levels. **Journal of Oral Rehabilitation**, v. 25, n. 4, p. 304-310, 1998.

MARCHINI, L.; TAMASHIHIRO, E.; NASCIMENTO, D. F. F.; CUNHA, V. P. P. 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**, v. 21, n. 4, p. 226-228, 2004.

MARIÑO, R.; CALACHE, H.; WRIGHT, C.; SCHOFIELD, M.; MINICHIELLO, V. Oral health promotion programme for older migrant adults. **Gerodontology**, v. 21, n. 4, p. 216-225, 2004.

MCGRATH, C.; ZHANG, W.; LO, E. C. A review of the effectiveness of oral health promotion activities among elderly people. **Gerodontology**, v. 26, n. 2, p. 85-96, 2009.

ORSI, I. A.; GARCIA JÚNIOR, A.; VILLABONA, C. A.; FERNANDES, F. H. C. N.; ITO, I. Y. Evaluation of the efficacy of chemical disinfectants for disinfection of heat-polymerised acrylic resin. **Gerodontology**, v. 28, n. 4, p. 253-257, 2011.

PARANHOS, H. F. O.; SILVA, C. H. L.; VENEZIAN, G. C.; MACEDO, L. D.; SOUZA, R. F. Distribution of biofilm on internal and external surfaces of maxillary complete dentures: the effect of hygiene instruction. **Gerodontology**, v. 24, n. 3, p. 162-168, 2007.

PERACINI, A.; ANDRADE, I. M.; PARANHOS, H. F. O.; SILVA, C. H. L.; SOUZA, R. F. Behaviors and hygiene habits of complete denture wearers. **Brazilian Dental Journal**, v. 21, n. 3, p. 247-252, 2010.

RIBEIRO, D. G.; PAVARINA, A. C.; GIAMPAOLO, E. T.; MACHADO, A. L.; JORGE, J. H.; GARCIA, P. P. N. S. Effect of oral hygiene education and motivation on removable partial denture wearers: longitudinal study. **Gerodontology**, v. 26, n. 2, p. 150-156, 2009.

SOUZA, R. F.; PARANHOS, H. F. O.; SILVA, C. H. L.; ABU-NABA'A, L.; FEDOROWICZ, Z.; GURGAN, C. A. Interventions for cleaning dentures in adults. **Cochrane Database of Systematic Reviews**, v. 4, art. CD007395, 2009.

TAKAMIYA, A. S.; MONTEIRO, D. R.; BARÃO, V. A. R.; PERO, A. C.; COMPAGNONI, M. A.; BARBOSA, D. B. Complete denture hygiene and nocturnal wearing habits among patients attending the prosthodontic department in a dental university in Brazil. **Gerodontology**, v. 28, n. 2, p. 91-96, 2010.

VIEIRA, A. P. C.; SENNA, P. M.; SILVA, W. J.; CURY, A. A. D. B. Long-term efficacy of denture cleansers in preventing *Candida spp*. biofilm recolonization on liner surface. **Brazilian Oral Research**, v. 24, n. 3, p. 342-348, 2010.

WEINMAN, J. Providing written information for patients: psychological considerations. **Journal of Royal Society of Medicine**, v. 83, n. 5, p. 303-305, 1990.

WHO-World Health Organization. **Oral health**: Fact sheet n. 318, April, 2012. Available from: <http://www.who.int/mediacentre/factsheets/fs318/en/>. Access on: Apr. 22, 2014.

Received on April 24, 2014.
Accepted on April 9, 2015.