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ORIGINAL RESEARCH

Evaluation of the Effect of Oral Hygiene Instructions on Maintenance of Gingival Health

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ABSTRACT

Aim: Tooth brushing is the most widespread means of controlling plaque at home. Research on instruction techniques for promotion of oral health abilities plays an important role in the prevention of periodontal diseases. Thus the aim of the present study was to compare the effect of written and oral individualized instructions of oral hygiene on gingivitis in an adult population.

Materials and methods: Sixty participants above the age of 18 years were included in the study. They were randomly allocated into one of the three groups: Oral instructions, written instructions, and oral individualized instructions. For all the participants, plaque and gingival indices were recorded using periodontal probe with Williams's markings and a mouth mirror, at baseline, at the end of 1st, 2nd, and 3rd week.

Results: Plaque and gingival index scores reduced in all the groups. However, it was seen that plaque index significantly reduced in the group receiving individualized instructions.

Conclusion: In view of the results of the present study, it can be implied that oral hygiene instructions should be provided, and they should be tailormade for each individual that would help correct the individual deficits in the learners.

Keywords: Individualized instructions, Modified bass technique, Oral hygiene.

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INTRODUCTION

Periodontal disease is a common oral infective disease presenting with varied severity and is the one, i.e., most often not reported. Maintenance of an effective plaque control is the cornerstone of any attempt to prevent and control periodontal diseases. Tooth brushing is the most widespread means of controlling plaque at home. The lack of plaque reduction despite adequate brushing frequency seems to be attributed to a lack of oral hygiene skills. Lack of oral hygiene skills in adults has also been reported addressing the effectiveness of self-performed mechanical plaque removal.[1] Therefore, research on instruction techniques for promotion of oral health abilities plays an important role in the prevention of periodontal diseases.

Although there does exist a whole body of research on oral hygiene instructions, most of this research suffers from methodological shortcomings, such as missing control groups.[2-4] Studies comparing different intervention techniques, such as the use of videos or modeling, barely differentiate basic methods, such as written and oral instruction or standardized and individualized instruction.[5-8]

Thus, today it is not entirely clear whether individualized interventions exceed the effects of more standardized procedures to an extent appearing to be worth the additional time spent on their appliance.

The aim of the present study was to compare the effect of written and oral individualized instructions of oral hygiene on gingivitis in an adult population.

MATERIALS AND METHODS

The study protocol was approved by the institutional committee of the Manipal College of Dental Sciences, Manipal University, Mangaluru, India. Sixty patients reporting to the outpatient clinic of the Department of Periodontology were included in the study. Systemically healthy subjects above the age of 18 years, with minimum 20 teeth, and with plaque and gingival index ≤1 were included in the study. Subjects who were on medications which affect the gingival and periodontal condition, severe malocclusion, patients undergoing orthodontic therapy, subjects with previous history of periodontitis and periodontal treatment, pregnant, or lactating women were excluded from the study.

Prior to allocation of patients to the study groups, a signed written informed consent was obtained from the participants. For all the participants, plaque and gingival indices[9,10] were recorded using periodontal probe with Williams's markings and a mouth mirror, at baseline, at the end of 1st, 2nd, and 3rd week.

The participants were then randomly allocated to the respective groups with 30 participants in each group.
Group I: Oral instructions on effective oral hygiene
Group II: Written instructions on effective oral hygiene
Group III: Oral individualized instructions

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The oral, written, and individualized instructions were all designed to last approximately the same time. For participants in group I, oral instructions were given on how to brush using the modified bass technique and in a language, i.e., understood by the patient. For participants in group II, a leaflet on how to brush their teeth using modified bass technique was provided. The technique was described in words pictures, and readers were instructed to practice brushing twice a day according to the technique explained.

Participants in the oral individualized intervention group were also presented with the same information as provided in the leaflet. The information was given by the same trained examiner; however, in this group, the examiner was aware of individual skill deficits, and emphasized all information relevant to overcome these deficits while demonstrating these techniques within the mouth of the participant at the respective sites.

The participants in all the three groups were given toothbrushes at the start of the study, and were instructed to use the same toothbrush till the end of the study.

RESULTS

The present study was conducted to evaluate the effectiveness of individualized instructions of oral hygiene in comparison to oral and written instruction. The data obtained from all the participants was statistically analyzed by the Statistical Package for the Social Sciences (SPSS) software version 13 (IBM, Bengaluru, India).

Table 1: Intergroup comparison of plaque and gingival indices

Groups	*(I) time*	*(J) time*	*Mean difference (I-J)*	*Sig.*
I	Base	Week 1	0.1060000	1.000
		Week 2	0.1246667	0.926
		Week 4	0.1233333	0.952
	Week 1	Week 2	0.0186667	1.000
		Week 4	0.0173333	1.000
	Week 2	Week 1		
		Week 4	–0.0013333	1.000
II	Base	Week 1	0.0573333	1.000
		Week 2	0.0673333	1.000
		Week 4	0.1813333	0.117
	Week 1	Week 2	0.0100000	1.000
		Week 4	0.1240000	0.635
	Week 2	Week 1		
		Week 4	0.1140000	0.818
III	Base	Week 1	0.2846667	0.02
		Week 2	0.2640000	0.037
		Week 4	0.2826667	0.022
	Week 1	Week 2	–0.0206667	1.000
		Week 4	–0.0020000	1.000
	Week 2	Week 1		
		Week 4	0.0186667	1.000

Table 2: Intragroup comparison of gingival index

Groups		*n*	*Mean*	*Std. deviation*	*F-value*	*p-value*
I	Base	15	0.791	0.201		
	Week 1	15	0.703	0.194		
	Week 2	15	0.674	0.232		
	Week 4	15	0.679	0.295	0.81	0.49
II	Base	15	0.873	0.246		
	Week 1	15	0.802	0.225		
	Week 2	15	0.754	0.236	0.86	0.47
	Week 4	15	0.754	0.237		
III	Base	15	0.975	0.355		
	Week 1	15	0.741	0.292		
	Week 2	15	0.713	0.269		
	Week 4	15	0.725	0.269	2.63	0.06

Table 3: Intragroup comparison of plaque index

Groups		*n*	*Mean*	*Std. deviation*	*F-value*	*p-value*
I	Base	15	0.783	0.189		
	Week 1	15	0.677	0.243		
	Week 2	15	0.659	0.222		
	Week 4	15	0.660	0.282	0.95	0.421
II	Base	15	0.828	0.197		
	Week 1	15	0.771	0.195		
	Week 2	15	0.761	0.221	2.03	0.121
	Week 4	15	0.647	0.213		
III	Base	15	0.925	0.272		
	Week 1	15	0.640	0.229		
	Week 2	15	0.661	0.257		
	Week 4	15	0.642	0.260	4.46	0.007 HS

HS: Highly significant

The intergroup variations were evaluated using the chi-square test, whereas intragroup variations were assessed using Bonferroni multiple comparison test.

The mean value of plaque and gingival indices obtained at the end of 1st, 2nd, and 3rd week was less than that at baseline. However, this difference was not statistically significant (Table 1).

Intragroup comparison of gingival index values did not show any statistical significance (Table 2). However, intragroup comparison of plaque index showed significantly improved values among participants who received individualized instructions (Table 3).

DISCUSSION

Maintenance of plaque control is the cornerstone to prevent periodontal diseases. Although plaque is exposed to saliva and the natural self-cleansing mechanism in oral cavity, it is not adequately eliminated. Hence, regular personal oral hygiene is necessary, and the most widespread mechanical means being tooth brushing. This has been proved in the pivotal study of Löe et al[11] wherein they demonstrated that plaque buildup was associated

with gingival inflammation and that removal of plaque reversed the process.

However, evidence also suggests that a thorough cleaning performed at regular intervals is mandatory to control plaque buildup. This requires appropriate motivation and instructions to the patient.[12]

The efficacy of brushing for plaque removal is assessed by three main factors: The design of toothbrush, frequency and duration of use of toothbrush, and the skill of the individual using the toothbrush.

Studies have shown that despite brushing twice daily, people have large amount of plaque suggesting that their brushing is inadequate. This indicates that maintenance of an effective level of plaque control is difficult using the conventional mechanical procedures, suggesting that there is definitely a need to educate and motivate a patient to establish improved gingival condition.

Oral hygiene instructions in most studies are a combination of patient information, motivation, and skill training.[13,14] The present study compared the effectiveness of oral hygiene instructions given to patients in three different ways: Oral, written, and individualized instructions. These instructions account for the Leh criteria for oral health and hygiene.[15]

In a study by Van der Weijden et al,[16] it was seen that there was a 52% reduction in plaque scores and 42% reduction in gingival scores in individuals in whom professional oral hygiene instructions and professional prophylaxis was provided.[16]

Studies have shown that oral standardized instructions proved to be more effective than written instructions.[17,18]

In the present study too, the group which received individualized instructions showed a reduction in the gingivitis scores when compared to the other groups, but the difference was not statistically significant. This could probably be due to the small sample size that was chosen, and that the observation period of 4 weeks is a less time to judge the learning skills of a person. The brushing technique taught in the oral and written instruction group, which was the modified bass technique, is a complex one and difficult to master.

In view of the results of the present study, it can be implied that oral hygiene instructions should be provided, and they should be tailormade for each individual that would help correct the individual deficits in the learners.

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