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## **The Evaluation of the Effects of Different Patient Information Strategy on Self-Performed Oral Hygiene in a Group of Turkish Population**

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### **Abstract**

The aim of this study was to investigate the effects of different patient information strategy on self-performed oral hygiene in a short and intermediate time period in a group of Turkish population. The study population consisted of 105 patient at the same socio-economical level and divided into three groups: Group I, who were not attended any program, group II, who attended only one explanatory session about oral hygiene, and group III, who attended a comprehensive education and motivation session. In order to evaluate the methodology applied, the Quigley-Hein's plaque index (PI, according to Quigley-Hein, 1962) and gingival bleeding index (GI, according to Löe and Silness, 1963) were calculated. All these patients' teeth were scaled at the start of the study. These parameters were determined at the initial and after 1st week, 1st and 3rd and 6th months. The results demonstrated a significant improvement in the PI and GI scores following the use of motivation and education program in the 1st week and 1st month ( $p < 0.01$ ). The level of oral hygiene and gingival health achieved at the first month was not observed in all 3 groups in the 3rd and 6th months. We found that the comprehensive session used here has also been effective in improving the oral hygiene and reducing the gingival inflammation in the 6<sup>th</sup> month ( $p < 0.01$ ). In conclusion, the data presented in this paper indicated that the education and motivation program with visual and demonstrated may be suitable alternative program improving the oral hygiene and reducing the gingival inflammation.

**Key words:** Education, motivation, oral hygiene, periodontal health.

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## I. Introduction

The role of plaque in etiology of gingivitis and periodontitis is well established. The pivotal study of Loe et al (1965) clearly demonstrated that gingival inflammation consistently follows the build-up or plaque, and conversely, removal of plaque can reverse this process. This finding not only demonstrated the control role of supragingival plaque in the development of gingivitis, but also that mechanical removal of plaque by oral hygiene practices can reverse these inflammatory changes<sup>1</sup>.

Dental plaque is a biofilm that is not easily removed from the surface of teeth. Therefore, the regular use of oral hygiene practices is requisite for proper supragingival plaque elimination. These practices require not only the appropriate motivation and instruction of the patient, but also the adequate tools<sup>2</sup>. Although Lindhe et al<sup>3</sup> stated that regular, non supervised, self-administrated oral hygiene alone cannot be considered an effective system of periodontal treatment in the absence of a cause-related periodontal therapy, Dahlen et al<sup>4</sup> stated that excellent long-term personal oral hygiene can modify both the quantity and composition of supgingival plaque.

Mechanical plaque controls demand active participation of the individual subject, and therefore, the establishment of proper oral home-care habits a process that to a great extent involves and depends on behavioural changes<sup>5,6</sup>. Oral hygiene programs, therefore, should include components such as self-assessment, self-examination, self-monitoring and self-instruction<sup>7</sup>. In addition to these programs, it is reported that brushing methods, brushing duration<sup>8</sup>, the force applied in brushing<sup>9</sup> and manual dexterity<sup>10,11</sup> have significant differences in removing bacterial plaque from tooth surface. Thus, the aim of this study was to investigate whether different patient information strategies affect the self-performed oral hygiene.

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## II. Material and Methods

Patients: A total of 105 adult patients, 56 males and 49 females with a mean age of 38.4 years, who applied to the department of periodontology (Atatürk University, Faculty of Dentistry) for the periodontal treatment, were recruited to participate in this study. All subjects were non-smokers, systemically healthy, had not taken any antibiotics or other drugs therapy for at least 6 months prior to the study, had 3 mm < periodontal pocket. Patients who were pregnancy and received periodontal therapy up to 6 month earlier were excluded from the study. A detailed description of the study was given to the patient.

Clinical examination and measurement: The effects of the various methods of instruction were evaluated by assessment of plaque and gingival bleeding scores. These parameters were determined at the initial and after treatment 1<sup>st</sup> week, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> months. In order to evaluate the methodology applied, the Qigley-Hein's plaque index (PI)<sup>12</sup> and gingival bleeding index (GI)<sup>13</sup> were calculated. On determining PI scores, the teeth were painted with erythrosine as the necessity of index method. GI scores were measured using a Williams' periodontal probe. All clinical periodontal measurements were made by an experienced periodontist who was not aware of the selection at the dental quadrant in which the scaling and root planning were performed, and who was blind to group selection.

Method: 105 patient, applied periodontology department were divided into 3 groups: Group I, a group of 35 patient who were not attended any programme; group II, a group of 35 patient who attended only one explanatory session about oral hygiene such as procedures for control of supragingival plaque, use of a toothbrush and fluoridated toothpaste, use of interdental cleaning devices, mouthrinses and other oral hygiene aids; and group III, a group of 35 patient who attended an education and self instruction oral hygiene session. In this session, in addition to explanatory session about oral hygiene, the etiology and microorganisms of periodontal diseases was described

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and seen on light microscope. The effects of periodontal diseases on alveolar bone and teeth were demonstrated on a study model. All of these issues were showed to patients in power point computer program by professional physician together with a public health nurse. The number of the groups was equal so that reliable comparison could be done. Our aim via choosing this method was to investigate the effects of visual, practical and explanatory system on self-performed oral hygiene in a short and intermediate time period and to evaluate our effective education and motivation method. At the beginning of the study, the PI and GI scores of each group were noted. Following the initial examination and measurement, conventional periodontal treatment (Scaling and root planning) was performed. The brushing technique of each patient was modified. Bass brushing technique was advised, and a short brochure describing the bass brushing technique was given. All of the education and motivation sessions were made face to face.

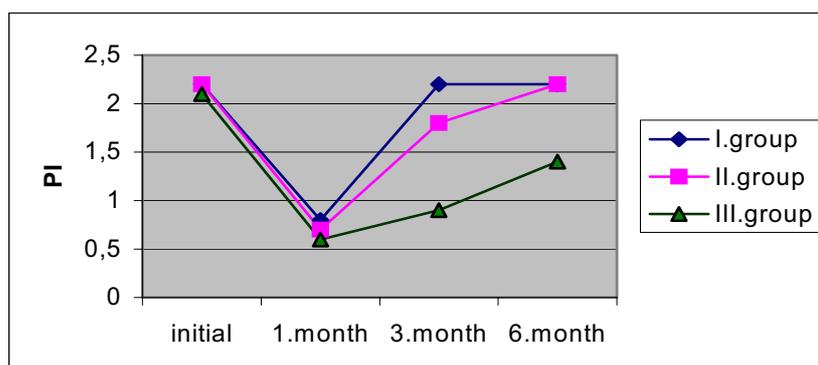
### III. Data Analysis

Student t test was used to assess the differences between the groups, and all clinical parameters within a group were determined with the paired t test.

### IV. Findings

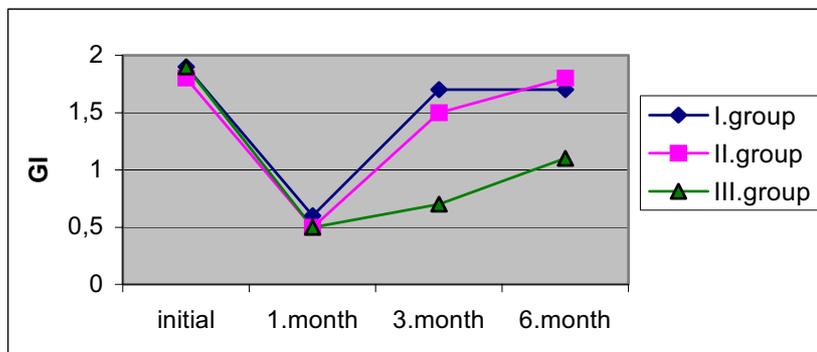
In the initial, 1<sup>st</sup> week, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month PI and GI scores of the patients who were divided into three groups were determined (Fig.1,2).

Fig 1: The PI scores of all groups before and after education and motivation



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Fig 2: The GI scores of all groups before and after education and motivation



These scores were statistically analysed between and within groups. According to these results, the PI and GI scores of each groups did not show a statistically differences in the initial ( $p>0.05$ ) (Table 1,3)

Table 1: The comparison in initial, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month PI scores between groups

	N	PI			t <sub>I-II</sub>	t <sub>I-III</sub>	t <sub>II-III</sub>
		I.group	II. group	III. group			
		$\bar{x} \pm sd$	$\bar{x} \pm sd$	$\bar{x} \pm sd$			
Before education And motivation							
Initial	35	2,20±0,17	2,20±0,17	2,11±0,41			
After education and motivation							
1 <sup>st</sup> week	35	0,60±0,18	0,61±0,19	0,60±0,14			
1 <sup>st</sup> month	35	0,80±0,22	0,70±0,16	0,60±0,14			
3 <sup>rd</sup> month	35	2,20±0,16	1,83±0,36	0,90±0,29	*	*	*
6 <sup>th</sup> month	35	2,20±0,19	2,20±0,18	1,40±0,37		*	*

Student t test      \* p <0.01 at significant level      i: I.group    ii:II.group    iii:III.group

After the conventional periodontal treatment and education and motivation, significant statistical differences in each groups' PI and GI scores were observed in the 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month compared

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with the initial ( $p < 0.01$ ) (Table 2,4). When the PI and GI scores of each group were compared in the 1<sup>st</sup> week and 1<sup>st</sup> month, statistical differences were not observed between groups ( $p > 0.05$ ). The PI and GI scores of each group were become risen in the 1<sup>st</sup> month. But, this risen was higher in group I and group II than group III. In the 6<sup>th</sup> month, while there were not observed statistical

Table 2: The comparison in initial, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month PI scores within groups

	Before education and motivation		After education and motivation				ti-I	ti-III	ti-vI	tIII-vI
	PI		PI							
	N	initial $\bar{x} \pm sd$	1 <sup>st</sup> month $\bar{x} \pm sd$	3 <sup>rd</sup> month $\bar{x} \pm sd$	6 <sup>th</sup> month $\bar{x} \pm sd$					
I.group	35	2,20±0,17	0,80±0,22	2,20±0,16	2,20±0,19	*				
II. group	35	2,20±0,17	0,70±0,16	1,83±0,36	2,20±0,18	*	*	*		
III. group	35	2,11±0,41	0,60±0,14	0,90±0,29	1,40±0,37	*	*	*	*	

Paired t test      \* p < 0.01 at significant level      i: initial    I: 1<sup>st</sup> month    III: 3<sup>rd</sup> month    vI: 6<sup>th</sup> month

Table 3: The comparison in initial, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month GI scores between groups

	N	GI			ti-I	ti-III	tII-III
		I. group $\bar{x} \pm sd$	II. group $\bar{x} \pm sd$	III. group $\bar{x} \pm sd$			
Before education And motivation							
Initial	35	1,91±0,14	1,80±0,1	2,91±0,13			
After education and motivation							
1 <sup>st</sup> week	35	0,61±0,16	0,50±0,13	0,51±0,11			
1 <sup>st</sup> month	35	0,60±0,15	0,51±0,12	0,50±0,13			
3 <sup>rd</sup> month	35	1,91±0,14	1,52±0,12	0,71±0,10	*	*	*
6 <sup>th</sup> month	35	1,91±0,13	1,82±0,10	1,11±0,12		*	*

Student t test      \* p < 0.01 at significant level      I: I.group    II: II.group    III: III.group

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Table 4: The comparison in initial, 1<sup>st</sup>, 3<sup>rd</sup> and 6<sup>th</sup> month GI scores within groups

	Before education and motivation		After education and motivation				ti-1	ti-III	ti-v1	tIII-v1
	GI		GI							
	N	initial $\bar{x} \pm sd$	1 <sup>st</sup> month $\bar{x} \pm sd$	3 <sup>rd</sup> month $\bar{x} \pm sd$	6 <sup>th</sup> month $\bar{x} \pm sd$					
I.group	35	1,91±0,14	0,60±0,15	1,91±0,14	1,91±0,13	*				
II. group	35	1,80±0,12	0,51±0,12	1,52±0,12	1,82±0,10	*	*	*	*	
III. group	35	1,91±0,13	0,50±0,13	0,71±0,10	1,11±0,12	*	*	*	*	
Paired t test	* p <0.01 at significant level		i: initial	i: 1 <sup>st</sup> month	III:3 <sup>rd</sup> month	vi:6 <sup>th</sup> month				

Differences in the first and second groups' PI and GI scores in terms of initial ( $p>0.05$ ), the statistical differences were observed in the third group in spite of an increase ( $p<0.01$ ).

## V. Discussion

Periodontal diseases are a major cause of tooth loss in adults. So, the best way to protect against the periodontal diseases is to remove bacterial plaque from tooth surfaces mechanically. Not only is it important for patients to establish a regular routine for oral care, it is also important that the use proper techniques so that they don't damage their gums<sup>14</sup>.

Echeverria<sup>15</sup> reported that since a variety of mechanical and chemical products are used in the self-control of supragingival plaque, the possibility exists that some deleterious effects may appear as a consequence of these oral hygiene practices.

Toothbrushing can cause damage both to soft and hard tissues. Trauma to soft tissues results in gingival erosion and gingival recession. These lesions have been associated with toothbrush stiffness, the method of brushing and the brushing frequency<sup>2,15</sup>. Therefore, oral hygiene instruction should be tailored to each individual patient on the bases of his/her personal needs and other

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factors. The patient should be involved in the instructional process<sup>2</sup>. For this reason, this study was planned to investigate the effectiveness of different patient information sessions on self- performed oral hygiene. Study population was divided randomly into three groups: The first group referred to no motivation sessions and oral hygiene training, the second group received a less comprehensive programme consisting of oral hygiene instructions, the third group received a comprehensive oral hygiene training program consist of information lesson explaining the etiology and prevention of dental diseases, and tutoring self-diagnosis of their own dental plaque and gingival inflammation, and demonstrated together with motivation on a study model and computer program. That socio-demographic features of the patients show similarity and that the initial PI and GI scores did not show differentiation are the indicator of homogeneity of the groups.

The results indicated that each of the two educations and motivation programs had an effect not significantly different from that of the group I, who did not received oral hygiene training. Hence, patients in all three groups demonstrated a decrease in the PI and GI scores in 1<sup>st</sup> week and 1<sup>st</sup> month. We think that these results may be derived from conventional periodontal treatment given at the beginning of the study. The patient in the group I demonstrated the highest increase in the PI and GI scores in the 3<sup>rd</sup> month. In this month, an increase in the PI and GI scores of group II and III were also observed. We can say that the effects of motivation disappear in this month. We found that the comprehensive session used here has also been effective in improving the oral hygiene and reducing the gingival inflammation in the 6<sup>th</sup> month. The assessed differences from the other groups were all statistically significant. There were no significant differences between the group I and group II in the 6<sup>th</sup> month.

There are reports describing dental prevention programs achieving a low incidence of dental plaque<sup>16-19</sup>. And these programs often combined some professional help with the self-control measurement. We also applied to professional care at the beginning of study. A comprehensive new

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oral hygiene program had lately been described by Albandar et al<sup>20</sup>. In present study, this method was used. Ower<sup>21</sup> reported that the delivery of oral hygiene advice is a crucial component of the management of patients susceptible to periodontal disease. However, the complexity of the issues surrounding such advice is frequently underestimated. It is not simply a question of manual dexterity; many factors influence compliance and motivation, including lifestyle, beliefs, attitude and understanding, and such factors need to be taken into account in order to effect permanent change in a patient's habits. Toassi et al<sup>19</sup> reported that the motivational reinforcement in educational and preventive programs has a positive effect for the reduction and control of gingival bleeding and bacterial plaque. A study designed by Glavind et al<sup>22</sup> indicated that the self-educational programs were as effective in changing oral hygiene habits of the patients as was personal oral hygiene instruction by dental personnel. In a study, evaluation of a television-tape demonstration for the reinforcement of oral hygiene instruction, designed by Glavind<sup>23</sup>, it was found that improvement in the plaque and gingival bleeding scores recorded at the 8 weeks examination showed no difference between the 2 groups of patients. But, in present study, there is a statistical difference in third group, received a comprehensive oral hygiene training program on computer, compared the other group in the 6<sup>th</sup> month.

Motivation is the most critical factor in productivities of his/her practice<sup>18</sup>. However, motivation is a periodical phenomenon, and its effect is not long-lived<sup>6,24</sup>. Horstter<sup>24</sup> stated that the effect of education and motivation disappear in the time, and individuals should be motivated in determined interval for the success of treatment. Suomi<sup>25</sup> and Ramfjord<sup>26</sup> reported that professional care and repeated motivation should be performed in every three month in order to maintain oral hygiene. The type of giving knowledge is also important in order to be success of education and motivation<sup>27</sup>. This study was part of a research project designed originally to investigate the effects of different oral hygiene training programme on the PI and GI scores. Our results consistent with

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previous studies' results in the 1<sup>st</sup> week and 1<sup>st</sup> month. But, present study showed, as distinct from previous study, that the comprehensive oral hygiene training programme has a significant effect on PI and GI scores in the 6<sup>th</sup> month. In conclusion, the data presented in this paper indicated that the education and motivation program with visual and demonstrated may be suitable alternative program to removing of bacterial plaque. However, in future, long-term work is require to elucidate the role of the above motivation on elimination of gingivitis.

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### **References**

1. Loe H. Oral hygiene in the prevention of caries and periodontal disease. *Int Dent J* 2000;50:129-139.
2. Lindhe J, Karring T, Lang NP. *Clinical periodontology and implant dentistry*. Blackwell Munksgaard, 4<sup>th</sup> ed. 2003, p:449-459.
3. Lindhe J, Okamoto H, Yoneyama T, Haffajee A, Socransky SS. Longitudinal changes in periodontal diseases in untreated subjects. *J Clin Periodontol* 1989; 16:662-670.
4. Dahlen G, Lindhe J, Sato K, Hanamura H, Okamoto H. The effect of supragingival plaque control on the subgingival microbiota in subject with periodontal disease. *J Clin Periodontol* 19:802-809.
5. Silberman SL, Le Jeune RC, Serio FG, Devides M, Davidson L, Vernon K. A method for determining patient oral care skills: The University of Mississippi oral hygiene index. *J Periodontol* 1998;69:1176-1180.
6. Garcia-Godoy F. Patient motivation and preventive dentistry. *J Periodontol* 1983;8:105-107.
7. Ley P. Satisfaction, compliance and communication. *Br J Clin Psychol* 1982;21:241-254.
8. Hencock, E.B."Prevention". *Ann Periodontol* 1996;1: 223-225.
9. Weljden VGA, Timmerman MF, Darser M, Velden VDU. Relationship between the plaque removal efficacy of a manual toothbrush and brushing force. *J Clin Periodontol* 1988; 25: 413-416.

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10. Tezel A, Orbak R, Canakçı V. The effects of right or left-handedness on oral hygiene. Intern J Neuroscience 2001;109(1-2):1-9.
11. Kenny EB, Saxe SR, Lenox JA, Cooper TM, Caudil JS et al. The relation of manual dexterity and knowledge to performance of oral hygiene. J Periodontol Resc 1976; 11: 63-73.
12. Quigley H. & Hein, JN. Comparative cleaning efficiency of manual and power brushing. J Am Dent Ass 1962; 65: 26.
13. Loe H, Silness G. Periodontal diseases in pregnancy II. correlation between oral hygiene and periodontal condition. Acta Odonto Scand 1964;22: 328-333.
14. Results of AAP survey on patient motivation, habits, and education. American Academy of Periodontology. [www.perio.org.2003](http://www.perio.org.2003).
15. Echerria JJ. Managing the use of bucal hygiene aids to prevent damage: Effects and sequelae of the incorrect use of mechanical plaque removal devices. In Lang NP, Attström R, Loe H. Proceeding of the European Workshop on Mechanical Plaque Control. London, Quintessence, 1998;pp:268-278.
16. Gruber I, Hamm G, Wandinger E, Sonnabend E. The effects of the motivation of a tracing device in the hygiene phase of PA treatment. Schweiz Monatsschr Zahnmed 1992;102(12):1473-6.
17. Glavind L, Zeuner E, Attstrom R. Oral hygiene instruction of adults by means of a self-instructional manual. J Clin Periodontol 1981;8(3):165-176.
18. Jameson C. Helping people change: The magic of motivation. J Okla Dent Assoc 2003;94(2): 16-29.
19. Toassi RF, Petry PC. Motivation on plaque control and gingival bleeding in school children. Rev Saude Publica 2002;36(5):634-7.
20. Albandar JM, Buischi YA, Oliveira LB, Axelsson P. Lack of effect of oral hygiene training on periodontal disease progression over 3 years in adolescents. J Periodontol 1995;66(4):255-60.
21. Owes P. The role of self-administered plaque control in the management of periodontal diseases: 2. motivation, techniques and assessment. Dent Update 2003;30(3):110-116.
22. Glavind L, Christensen H, Pedersen E, Rosendahl H, Attstrom R. Oral hygiene instruction in general dental practice by means of self-teaching manuals. J Clin Periodontol 1985;12(1):27-34.
23. Glavind L, Zeuner E. Evaluation of a television-tape demonstration for the reinforcement of oral hygiene instruction. J Clin Periodontol 1986;13(3):201-204.
24. Horstter G, Hoogstraten J. Immediate and delayed effects of dental health education film on periodontal knowledge, attitudes and reported behaviour of Dutch adolescents. Community Dental Oral Epidemiol 1989;17:183-186.
25. Suomi JD, Green JC, Vermillion JR, Doyle J, Chong JJ, Leathervood EC. The effect of controlled oral hygiene procedures on the progression of periodontal disease in adults results third and final year. J Periodontol 1971;2:152-160.
26. Ramfjord SP, Morris EC, Burgett FG, Nissle RR, Shick RA, et al. Oral hygiene and maintenance of periodontal support. J Periodontol 1982;53:26-30.
27. Gluch-Scranton J. Motivational strategies in dental hygiene care. Semin Dent Hyg 1991;3(1):1-4, 6-8.