



Evaluating the Periodontal Status and Oral Hygiene Habits Among Dental Patients

Gülnehal Eren, Sema Becerik

Abstract

Objective: The periodontal status is important for treatment planning. The aim of this cross-sectional study was to determine the periodontal status and to explore the relationship between demographic and socio-economic data and smoking and systemic health and oral hygiene habits of subjects who attended Ege University School of Dentistry.

Methods: All subjects were interviewed with a structured questionnaire. Gender, educational status, income profit, smoking habits, systemic problems, dental treatment frequency, and oral hygiene habits were recorded using this questionnaire. The periodontal status was evaluated by CPITN and plaque and gingival indexes. Data were analyzed using a statistical program.

Results: When periodontal conditions were investigated, 69.5% of the subjects had gingivitis and 30.5% had periodontitis. The tooth brushing habits and frequency of replacing a new toothbrush were significantly different between the gingivitis and periodontitis groups ($p<0.05$). CPI values negatively correlated with financial income and education level ($p<0.05$). A positive correlation was observed between the level of education and number of existed teeth ($p<0.001$).

Conclusion: According to our results, subjects showed poor periodontal health and a lack of oral hygiene habits. Our results showed an extremely high demand for periodontal health service programs. The present study indicates a need for oral health promotion including health education along with oral healthcare service provision.

Keywords: Periodontal diseases, oral health, oral hygiene

Introduction

While the basic etiological factor in periodontal disease is microbial dental plaque, it has been concluded in epidemiological studies of this condition that periodontal health may also be affected by oral care habits, systemic disease, and socio-economic and demographic status (1, 2). When periodontal disease is diagnosed early, it can be treated easily and successfully. The effectiveness of periodontal treatment and the importance of oral care habits in reducing the rate of tooth loss are well known (3). In studies conducted to date, the positive effects of plaque control methods on periodontal health have been demonstrated by clinical periodontal parameters (4, 5).

Because the symptoms of periodontal disease are not as life-threatening as those of other diseases, they are generally ignored by society. The presence of this disease is often established through suggestions and detection by physicians rather than through complaints presented by patients (6). Therefore, periodontal disease is highly prevalent in society (7). However, periodontal disease affects quality of life in many ways (8). It has been shown in many studies that the signs and symptoms of periodontitis, such as bad breath loose teeth, gum bleeding during brushing, gingival recession, and tooth sensitivity, have negative effects on the everyday activities and quality of life of individuals (8, 9).

The incidence of periodontal disease in communities, the severity of illness, and the need for treatment are interrelated. Thus, epidemiological studies on periodontal disease are generally conducted using the Community Periodontal Index of Treatment Needs (CPITN) (10). In addition to clinical measurements, questionnaires on oral health are considered to be one of the most reliable methods to determine current oral-tooth health status in the community and to plan for the future in this regard (11). Questionnaires that assess the oral health care of individuals are useful methods to present a clear picture of the current status of oral health (12).

A limited number of studies have been conducted in our country on the periodontal status of patients admitted to faculties of dentistry and on the oral health care habits of these patients (13, 14). In order to determine the periodontal health status and oral health care needs of an individual, clinical periodontal examination and assessment of oral care applications are required.

Department of Periodontology, Ege University School of Dentistry, Izmir, Türkiye

Address for Correspondence:
Gülnehal Eren,
E-mail: gulnehal_karasu@hotmail.com

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In this study, we aimed to determine the oral health care habits of patients admitted for treatment to a faculty of dentistry, along with the dental periodontal health status and the demographic data of these patients.

Methods

Individuals

Our study was conducted with 187 patients who applied to the Faculty of Dentistry, Department of Periodontology, Ege University between June 2015 and November 2015. Our study was approved by the Ege University Clinical Trials Ethics Committee, and volunteer informed consent forms were signed by the patients who agreed to participate in this study. Clinical measurements were conducted in order to determine the periodontal status of the participants. Questionnaire forms were also used to determine the oral health care habits and demographic data of the individuals.

Periodontal examination

In our study, oral periodontal examinations of all four side surfaces of each tooth were performed. Plaque index (PI) (15), gingival index (GI) (16), and CPITN (10) data were recorded. According to the CPITN, 0=healthy periodontium, 1=presence of gingival bleeding, 2=presence of tartar with gingival bleeding, 3=presence of shallow periodontal pockets (4–5 mm), and 4=presence of deep periodontal pockets (10). In our study, patients with CPI scores of 1 and 2 were classified in the gingivitis group, while patients with CPI scores of 3 and 4 were classified in the periodontitis group (17). All periodontal measurements were carried out with Who probe (Hu Friedy; Chicago, USA) by a calibrated periodontist (G.E.).

Survey Study

The patients who participated in the study were asked to answer a questionnaire without providing identifying information. The first part of the questionnaire consisted of questions regarding sociodemographic data (age, sex, education, and financial income); the second part focused on systemic conditions (smoking habits and presence of systemic disease); and the last part focused on oral health care habits (tooth-brushing habits, frequency of toothbrush changes, flossing, periodontal disease awareness, latest dentist visit).

Statistical analysis

To compare categorical variables, non-parametric Pearson's chi-square test and Fisher's exact chi-square analysis test were used. For intergroup comparisons, the Mann-Whitney U test was used. For statistical analysis of the data, the Statistical Package for the Social Sciences 20.0 (SPSS Inc.; Chicago, IL, USA) statistical software package was used. For all statistical analyses, $p < 0.05$ was considered to be significant.

Results

Demographic data

One hundred and eighty-seven patients (average age \pm SD, 41.1 ± 12.6) who were admitted to the Ege University School of Dentistry, Department of Periodontology, were included in the study. According to the clinical evaluations performed, 130 patients (average age \pm SD, 37.7 ± 9.7) with CPI scores of 1 and 2 were included in the gingivitis group; 57 patients (average age \pm SD, 42.1 ± 13.2) with CPI scores of 3 and 4 were included in the periodontitis group. The gender, age, education, financial status, smoking status, and

presence of systemic disease of the patients who were included in the study are presented in Table 1.

The gingivitis group consisted of 79 females and 51 males, while the periodontitis group included 31 females and 26 males. There was no statistically significant difference in gender distribution between the two groups ($p > 0.05$). When the age distribution of individuals in different study groups was considered, 58 patients from the gingivitis group and 24 patients from the periodontitis group were aged 20–39 years; 65 patients from the gingivitis group and 27 patients from the periodontitis group were aged 40–59 years; and 7 patients from the gingivitis group and 6 patients from the periodontitis group were aged 59–69 years. There was no statistical difference in terms of the age distribution of individuals between the two groups ($p > 0.05$).

The questionnaire contained questions regarding the education level of the patients. In the gingivitis group, 43 of the participants were primary education school graduates, 36 were high school graduates, 48 were college graduates, and 3 had obtained a PhD degree; meanwhile, the periodontitis group contained 24 primary education school graduates, 17 high school graduates, 15 college graduates, and 1 participant with a PhD degree. Education status was found to be similar between the two groups ($p > 0.05$). The financial income distributions of the participants in both groups were identified in the questionnaire, and no difference was found between the two groups ($p > 0.05$) (Table 1).

In the gingivitis group, there were 37 smokers, 79 non-smokers, and 14 patients who had quit smoking; meanwhile, in the periodontitis group, there were 24 smokers, 30 non-smokers, and 3 patients who had quit smoking. There was no statistical difference between the two groups in terms of smoking habit ($p > 0.05$).

In the gingivitis group, 36 patients were determined to have systemic disease, while 94 patients had no systemic disease; in the periodontitis group, 21 patients were determined to have systemic disease, while 36 patients had no systemic disease. There was no statistical difference between the two groups in terms of the presence of systemic disease ($p > 0.05$).

Oral health care habits and gingival disease awareness

In the questionnaire, the patients in both study groups were asked questions about their oral health care habits. The data regarding the oral health care habits and awareness of gingival disease of the participants are shown in Table 2.

The patients were asked whether they had a dental check-up within the last year. 56 participants in the gingivitis group and 21 participants in the periodontitis group stated that they had visited a dentist within the last year; no significant difference was found between the two groups ($p > 0.05$). When the participants were asked "Do you know what gingival disease is?" 48 participants from the gingivitis group and 15 patients from the periodontitis group answered "Yes." There was no significant difference between the two groups regarding the proportion of participants with knowledge of gingival disease ($p > 0.05$).

When the participants were asked "Do you have gingival bleeding?" 92 participants from the gingivitis group and 44 participants from the periodontitis group answered "Yes." There was no difference in terms of gingival bleeding between the two

Diagnosis		Gingivitis n=130 (69.5%)	Periodontitis n=57 (30.5%)	Total n=187 (100%)	p
Gender	Female	79 (60.8%)	31 (54.4%)	110 (58.8%)	p>0.05
	Male	51 (30.2%)	26 (45.6%)	77 (41.2%)	
Age	20–39	58 (22.3%)	24 (21.1%)	82 (22.1%)	p>0.05
	40–59	65 (25%)	27 (23.7%)	92 (24.6%)	
	59–69	7 (11.5%)	6 (14.9%)	13 (12.3%)	
Education	Elementary	43 (33.1%)	24 (42.1%)	67 (35.8%)	p>0.05
	High school	36 (27.7%)	17 (29.8%)	53 (28.3%)	
	College	48 (36.9%)	15 (26.3%)	63 (33.7%)	
	PhD	3 (2.3%)	1 (1.8%)	4 (2.1%)	
Financial status (TL)	<1000	39 (30.0%)	27 (47.4%)	66 (35.3%)	p>0.05
	1000-2000	69 (53.1%)	23 (40.4%)	92 (49.2%)	
	2000-3000	17 (13.1%)	7 (12.3%)	24 (12.8%)	
	>3000	5 (3.8%)	0 (0%)	5 (2.7%)	
Smoking status	Smoker	37 (28.5%)	24 (42.1%)	61 (32.6%)	p>0.05
	Non-smoker	79 (60.8%)	30 (52.6%)	109 (58.3%)	
	Quit	14 (10.8%)	3 (9.1%)	17 (9.1%)	
Systemic disease	Yes	36 (27.7%)	21 (36.8%)	57 (30.5%)	p>0.05
	No	94 (72.3%)	36 (63.2%)	130 (69.5%)	

TL: Turkish lira

Diagnosis		Gingivitis n=130 (69.5%)	Periodontitis n=57 (30.5%)	Total n=187 (100%)	p
Dentist visit (in the past year)	Yes	56 (43.1%)	21 (36.8%)	77 (41.2%)	p>0.05
	No	74 (56.9%)	36 (63.2%)	110 (58.8%)	
Do you know what gingival disease is?	Yes	48 (36.9%)	15 (26.3%)	63 (33.7%)	p>0.05
	No	82 (63.1%)	42 (76.7%)	124 (66.3%)	
Gingival bleeding	Yes	92 (70.8%)	44 (77.2%)	136 (72.7%)	p>0.05
	No	38 (29.2%)	13 (22.8%)	51 (27.3%)	
Frequency of tooth brushing	1/Day	33 (25.4%)	13 (22.8%)	46 (26.6%)	p<0.001
	2/Day	75 (57.7%)	23 (40.4%)	98 (52.4%)	
	>2/Day	8 (6.2%)	0 (0%)	8 (4.3%)	
	1/ 2-3 Day	14 (10.8%)	18 (31.6%)	32 (17.1%)	
	less than 1/2–3 Day	0 (0%)	3 (5.3%)	3 (1.6%)	
Change of toothbrush	2-3 months	54 (41.5%)	12 (21.1%)	66 (35.3%)	p=0.001
	6 months	70 (53.8%)	34 (59.6%)	104 (55.6%)	
	1 year	4 (3.1%)	4 (7%)	8 (4.3%)	
	Less than 1 year	2 (1.5%)	7 (12.3%)	9 (4.8%)	
Dental floss use	Yes	19 (14.6%)	4 (7%)	23 (12.3%)	p>0.05
	No	111 (85.4%)	53 (93%)	164 (87.7%)	

groups ($p>0.05$). Individuals were asked about their tooth brushing frequency (Table 2). It was determined that participants in the periodontitis group brushed their teeth less frequently than those in the gingivitis group; this difference was found to be statistically significant ($p<0.001$). The patients were also asked how often they changed their toothbrushes (Table 2). It was determined that participants in the periodontitis group changed their toothbrushes less frequently than participants in the gingivitis group; this difference was also found to be statistically significant ($p<0.001$).

When the participants were asked if they used dental floss, 4 patients from the periodontitis group and 19 patients from the gingivitis group answered “Yes.” There was no significant difference between the two groups in terms of dental floss use ($p>0.05$).

Correlation between clinical parameters and demographic data

In the correlation analysis, while the education level of the participants in a particular age range and the number of teeth were negatively correlated, the PI and GI values showed positive correlations with education level. It was determined that the participants'

Table 3. Demographic data correlated with each other and with clinical parameters

	Age range	Financial income	Level of education	Number of teeth	CPI	PI	GI
Age range			R=-0.364 P<0.01	R=-0.636 P<0.01		R=0.215 P=0.003	R=0.178 P=0.015
Financial income			R=0.438 P<0.001		R=-0.149 P=0.042		
Level of education	R=-0.364 P<0.01	R=0.438 P<0.001		R=0.320 P<0.001	R=-0.167 P=0.023	R=-0.242 P=0.001	
Number of teeth	R=-0.636 P<0.01		R=0.320 P<0.001			R=-0.288 P<0.001	R=-0.281 P<0.001
CPI		R=-0.149 P=0.042	R=-0.167 P=0.023			R=0.632 P<0.001	R=0.513 P<0.001
PI	R=0.215 P=0.003		R=-0.242 P=0.001	R=-0.288 P<0.001	R=0.632 P<0.001		R=0.695 P<0.001
GI	R=0.178 P=0.015			R=-0.281 P<0.001	R=0.513 P<0.001	R=0.695 P<0.001	

CPI: community periodontal index; PI: plaque index; GI: gingival index

financial income showed a positive correlation with their levels of education, whereas financial income was negatively correlated with CPI value. It was also found that the level of education showed a positive correlation with the number of teeth, while it was negatively correlated with the CPI and PI values. Furthermore, it was determined that the number of teeth showed negative correlations with PI and GI. While CPI value showed positive correlations with PI and GI, there was also a positive correlation between PI and GI. The R and p values of the correlations are shown in Table 3.

Discussion

One of the most important factors in maintaining periodontal health is receiving dental care on a regular basis. When treatment of periodontal disease is delayed, complex and long-term treatment becomes necessary. Therefore, early diagnosis and regular dental control is very important in periodontal disease. In this study, the periodontal status, demographic data, and oral health care habits of patients who were admitted to the Ege University School of Dentistry for a variety of treatment needs were analyzed.

In most studies examining the relationship between gender and periodontal disease, it has been shown that the severity of periodontal disease is higher among males (18, 19). Due to these results, gender differences in the prevalence and severity of periodontal disease are believed to be associated with attention and oral health care habits rather than genetic factors. In our study, no significant difference was found between male and female participants regarding periodontal status. This similarity may be due to the fact that the participants in our study were selected from patients who were admitted to the School of Dentistry.

In our study, the incidences of gingivitis and periodontitis were determined to be 69.5% and 30.5%, respectively. Gokalp et al. (14) found a prevalence of periodontal disease of 84.4% among people in the age range of 35–44 years. In a study that examined the prevalence of periodontal disease in children 14–15 years of age, the value was 7% (20). Similarly, in our study, the average age

of patients diagnosed with periodontitis was higher than that of those diagnosed with gingivitis. As stated in previous studies (21, 22), it was reported in our study that the prevalence and severity of periodontal disease increases with age.

It has been reported that the socioeconomic status of individuals has an impact on their periodontal treatment needs and knowledge of oral health (23). There is a negative correlation between the financial income and education level of our participants with CPI values. This result was consistent with the study conducted by Newman and Gift (24), which showed that low income limits consultation of dental services. It is reported that as the education level of individuals increases, oral health care improves, and periodic dental health care consultation becomes more common (25). Richard et al. (26) also indicated in their study that educational level is a determinant for periodontal disease. Similarly, our study demonstrated that the level of education is positively correlated with the number of existing teeth.

Smoking is a major risk factor for periodontal disease (27). It has been shown in many studies that the severity of gingivitis and periodontitis among smokers is higher than that among non-smokers (28, 29). It has been determined that compared to non-smokers, smokers place less importance on oral health care; thus, plaque accumulation is more common among smokers, and they are more prone to periodontal disease (30). In our study, the smoking rate in the gingivitis group was 28.5%; in the periodontitis group, it was 42.1%. Similarly, Akpınar et al. (13) reported that the severity of periodontal disease increases with smoking habit. Our results are consistent with the opinion that tobacco use has a negative impact on oral hygiene (13, 29, 30).

When the participants' awareness regarding periodontal disease was investigated with the question "What is gingival disease?," it was found that 66.3% of the participants were not knowledgeable about gingival disease. Similarly, in a study conducted by Thai Thani (31), about 60% of participants were reported to be unaware of periodontal disease. Contrastingly, in a study conducted by Base et al. (32), the awareness of periodontal disease of the participants

was found to be significantly low in patients admitted to the periodontology department; this was because the majority of patients who applied to the periodontology department were referred from other departments and did not apply to the periodontology department because of their complaints. These data indicate that a well-structured oral health care education program is required to maintain and improve standards of oral care health in our society.

In periodontitis patients of advanced age, a relationship between systemic disease prevalence and age has been detected; also, an increase in the number of individuals with systemic disease has been reported (33, 34). In the study conducted by Akpınar et al. (13), the presence of systemic disease was found to be higher in individuals with periodontitis compared to those with gingivitis. Additionally, the relationship between systemic disease and periodontal disease in individuals over 50 years of age has been found to be higher (27, 35). In our study, there was no difference between the gingivitis and periodontitis groups in terms of the presence of systemic disease. This similarity may be due to the fact that the average ages of our study groups were similar; also, the average age of the patients included in the study was not very high.

In order to maintain oral health care, it is crucially important that individuals receive dental care on a regular basis. Furthermore, regular checkups vary depending on each individual's existing oral health care, and risk factors vary depending on each person's disease susceptibility. Receiving a regular dental check-up is recommended at least once per 12 months for people over 18 years of age (36). It was reported in our study that 60% of our participants had not visited a dentist for a check-up within the last year. If regular dental care is not received, deterioration of oral health care is inevitable (37). In our society, it is very important to conduct informative activities in our education system regarding the importance of oral health care and to raise awareness within society via the media. Also, as indicated in a study by Özcan et al. (38), it is important to raise public awareness regarding the importance of regular dental check-ups and to inform individuals that they should not wait for a toothache before visiting a dentist.

In order to provide oral hygiene at an early age, it is known that getting people to brush their teeth and to use dental floss may stop the onset and progression of disease (39, 40). In our study, it was found that approximately 30% of patients in the periodontitis group brushed their teeth once every 2–3 days, whereas this rate was approximately 10% in patients with gingivitis. When flossing was examined, approximately 90% of the participants stated that they did not use dental floss. Apart from tooth brushing and dental floss use, regular toothbrush replacement is also an important factor in oral health care. It has been reported that oral health care habits are associated with the awareness and treatment needs of the participants (36). Similarly, in our study, patients with periodontitis appeared to have poorer tooth brushing and flossing habits and changed their toothbrushes less frequently compared to patients with gingivitis. The fact that the participants in the periodontitis group do not use oral care instruments regularly and change their toothbrushes rather infrequently may be an indication of lack of oral health education.

Conclusion

All the participants in our study had varying degrees of gingivitis or periodontitis, and all of them required periodontal treatment and oral health education. A limitation of our study is that the study

group consisted of patients admitted to the Faculty of Dentistry for dental treatment; thus, there are no periodontal disease-free individuals in the study. A sample group with a high number of individuals who properly represent society and who are assessed by parameters similar to those used in our study would include individuals with different levels of periodontal health and may reveal findings that reflect society more homogeneously.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics of committee of Ege University School of Medicine.

Informed Consent: Informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

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