

Research Paper: The prevalence of dental flossing in patients with chronic periodontitis in Iranian population



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ABSTRACT

Introduction: Improving the level of oral hygiene is one of the important principles that maintains oral health. There are no studies on the prevalence of dental floss usage and related factors among chronic periodontitis patients in Iran. This study aimed to evaluate the prevalence of flossing in patients with chronic periodontitis referred to the Dental Clinic of Guilan University of medical sciences in 2019.

Materials and Methods: In this study, 214 people who had referred to the dental clinic of Guilan University of Medical Sciences for periodontal assessment in 2019, were studied according to the inclusion and exclusion criteria. If the relevant hypothesis was established, chi-square test was used and otherwise Fisher exact test was utilized. The software used was SPSS version 24 and significant level of 0.05 was considered in all tests.

Results: According to the collected data, the number of men and women was almost equal. Most of the subjects were in the age group of 30-49. About half of surveyed people had under diploma education and most of them were married. About one third of these patients have visited a dentist less than a year ago. According to the results, there was no significant relationship between gender and flossing, as well as between visiting the dentist and the severity of the disease. But there was a significant relationship between marriage, education and brushing with the severity of the disease. The severity of the disease was higher in married people and also increased with decreasing level of education and frequency of brushing.

Conclusion: The prevalence of flossing was similar in men and women and different age groups, but was lesser in people with severe chronic periodontitis and diabetes. So, planning to educate and encourage people to the use dental floss is suggested.

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Introduction

One of the important principles in oral health maintenance is improving the level of oral hygiene (1). Dental caries and periodontal disease are common side effects of poor oral hygiene. Microbial plaque accumulation in the cervical region of the teeth, exactly close to the gingival margin leads to gingivitis (2).

Dental plaque formation occurs first at the interdental areas and then at other tooth surfaces. Daily removal of the plaque reduces the prevalence and severity of gingivitis (3).

If gingivitis left untreated; This inflammation can progress and cause chronic periodontitis. Chronic periodontitis is an inflammatory infectious condition that affects the supporting tissues of the tooth and causes attachment and bone loss (2). The prevalence of periodontitis usually increases with age. As well as poor socioeconomic status, smoking and diabetes increase the risk of periodontitis (4-6).

Cleaning the interdental area is an essential part of oral hygiene. There is not enough access for toothbrush to remove the microbial plaque from these regions (1, 7).

Tools such as dental floss, wooden and plastic picks, interdental brushes, single-tufted brushes, and oral irrigators have been introduced for interdental regions cleaning. Dental flossing has been suggested as a common method to reduce the prevalence and severity of gingivitis (1).

Up to now, few studies have been conducted to investigate the prevalence of dental floss usage.

Fleming et al. found that there was a significant difference in the rate of flossing in relation to the consumption or non-consumption of tobacco, gender and income. So, women and people with higher incomes used dental floss more and tobacco consumers did the opposite (5).

Cepeda et al. in a cross-sectional study found that flossing was associated with a reduced incidence of periodontitis and that 2-4 days of flossing per week was as beneficial as frequent use (3).

Due to the lack of information about the prevalence of interdental cleaners in periodontal

patients, the aim of this study was to investigate the prevalence of flossing in patients with chronic periodontitis in Iranian population.

Materials and methods

The present study is a cross-sectional descriptive-analytical study that investigated 214 patients referred to the Periodontics Department of Guilan University of Medical Sciences in 2019.

The study protocol was approved by the Ethics Committee at Guilan University of Medical Science (IR.GUMS.REC.1398.395).

The surveyed people were selected from periodontal examination patients. After explaining the purpose of the study and obtaining informed consent, the participants completed the questionnaires alone and without the help of others. The questionnaires for people with less than 20 teeth, as well as those that did not complete all parts of the questionnaires, were excluded.

In this study, patients with attachment and bone loss were included in the group of chronic periodontitis and subgroups were considered based on the severity (mild, moderate and severe) (8).

Patients were also grouped by gender, marital status, and diabetes (5).

Moreover depending on the age of the patients, they were divided into groups of 20-29 years, 30-49 years, 50-64 years and more than 65 years (3). Then, based on the number of flossing, patients were divided into three categories including without any flossing, 1-6 times a week and 7 or more times a week (5).

Subsequently, patients were placed in groups without any use of toothbrushes, 1-13 times a

week, and 14 and more than 14 times a week, according to the frequency of brushing during the week (9). Regarding smoking, patients were in the following groups: no smoking (patients with no history of smoking), current smoker (patients who have smoked at least 100 cigarettes in their lifetime and are currently smokers) and former smoker (patients who They have smoked at least 100 cigarettes in their lifetime and are not smoking now) (3).

Also patients were divided into groups high-school, diploma and undergraduate, bachelor and post graduate based on their level of education. And based on the patients' last visit to the dentist, patients were divided into groups of without referral, less than a year, between 1 and 3 years, and over the past 3 years.

To evaluate the validity of the questionnaire used in the research, seven experts surveyed the subject. The Content Validity Ratio (CVR) was 1, and the Content Validity Index (CVI) was 0.94. And these values were confirmed.

Also, to assess the reliability of the responses of 20 subjects to the questionnaire, the Cronbach alpha rate was 0.85%, which was also confirmed.

If the relevant hypothesis was established, chi-square test was used and otherwise Fisher exact test was utilized. SPSS software version 24 was used and a significant level of 0.05 was considered in all tests.

Results

About 50.5% of patients were women and the rest were men. Most of them were 30-49 years old (59.8%). About 86.9% of these people were married, and half of them (50.9%) had less education than diplomas, and a total of 38.3% of all of them had visited a dentist in less than a year (Table 1).

Table 1. The frequency of surveyed people:

Qualitative variable	n (%)	
Gender	Male	106 (49.5)
	Female	108 (50.5)
	Total	214 (100)
Age group	20-29	24 (11.2)
	30-49	128 (59.8)
	50-64	53 (24.8)
	65>	9 (4.2)
	Total	214 (100)
Marital status	Single	28 (13.1)
	Married	186 (86.9)
	Total	214 (100)

Qualitative variable	n (%)	
Education	High school	109 (50.9)
	Diploma and undergraduate	74 (34.6)
	Bachelor	26 (12.1)
	Post graduate	5 (2.3)
	Total	214 (100)
Last visit to the dentist	Less than a year ago	82 (38.3)
	1-3 years ago	58 (27.1)
	More than 3 years ago	59 (27.6)
	Never referred	15 (7)
	Total	214 (100)
Tooth brush	No brushing	22 (10.2)
	1-13 times per week	165 (77.1)
	14 and more per week	27 (12.6)
	Total	214 (100)
Diabetes	Yes	33 (15.4)
	No	181 (84.6)
	Total	214 (100)
Smoking	Every day	23 (10.7)
	Occasionally	34 (15.8)
	In the past	21 (9.8)
	Never	136 (63.5)
	Total	214 (100)

The prevalence of flossing was similar in all classifications, including both sex groups, all age groups, all levels of chronic periodontitis, diabetics or healthy people, and with any amount of tobacco use. No flossing during the week had the highest prevalence and seven or more usage had the lowest. Meanwhile, the prevalence of flossing decreased with increasing the severity of periodontitis and was also lower in people with diabetes than healthy individuals (Table 2).

Table 2. Summary of the results of comparing the frequency of flossing in people with chronic periodontitis in different groups:

Variable	The mean number and frequency of flossing in a week			Significance	
	0 times N (%)	1-6 times N (%)	7 ≤ times N (%)		
Gender	Male	81 (76.4)	19 (17.9)	6 (5.7)	0.623
	Female	78 (72.2)	25 (23.1)	5 (4.6)	
Age group	20-29	14 (58.3)	9 (37.5)	1 (4.2)	0.435
	30-49	97 (75.8)	25 (19.5)	6 (4.7)	
	50-64	40 (75.5)	9 (17)	4 (7.5)	
	65 >	8(88.9)	1 (11.1)	0 (0)	
Periodontitis	Mild	39(57.4)	23 (33.8)	6 (8.8)	<0.001 *
	Moderate	57 (75)	14 (18.4)	5 (6.6)	
	Severe	63 (90)	7 (10)	0 (0)	
Diabetes	No	128 (70.7)	42 (23.2)	11 (6.1)	0.018 *
	Yes	31 (93.9)	2 (6.1)	0 (0)	
Smoking	Every day	20 (87)	2 (8.7)	1 (4.3)	0.549
	Occasionally	24 (70.6)	9 (26.5)	1 (2.9)	
	In the past	18 (85.7)	3 (14.3)	0 (0)	
	Never	97 (71.3)	30 (22.1)	9 (6.6)	

*The significance level was < 0.05

According to the results of current study, the severity of periodontal disease was higher in married people and it decreased by increasing the level of education and frequency of brushing during the

week ($p < 0.05$). However, there was no significant relationship between the severity of periodontal disease and gender and the frequency of visits to the dentist ($p > 0.05$) (Table 3).

Table 3. Summary of the prevalence of periodontitis according to the variables studied:

Variable	Severity of periodontitis			Significance	
	Mild n (%)	Moderate n (%)	Severe n (%)		
Education	High school	27 (24.8)	36 (33)	46 (42.2)	<0.001 *
	Diploma and undergraduate	21 (28.4)	29 (39.2)	24 (32.4)	
	Bachelor	17 (65.4)	9 (34.6)	0 (0)	
	Post graduate	3 (60)	2 (40)	0 (0)	
Marital status	Single	8 (28.6)	15 (53.6)	5 (17.9)	0.024 *
	Married	60 (32.3)	61 (32.8)	65 (34.9)	
Tooth Brush	No brushing	5 (22.7)	8 (36.4)	9 (40.9)	0.042 *
	1-13 times	50 (30.3)	56 (33.9)	59 (35.8)	
	14 ≤ times	13 (48.1)	12 (44.4)	2 (7.4)	
Last visit to the dentist	Less than a year ago	28 (34.1)	32 (39)	22 (26.8)	0.376
	1-3 years ago	23 (39.7)	17 (29.3)	18 (31)	
	More than 3 years ago	14 (23.7)	21 (35.6)	24 (40.7)	
	Never	3 (20)	6 (40)	6 (40)	

*The significance level was < 0.05

Discussion

In the present study, the prevalence of dental flossing in patients with chronic periodontitis in the Iranian population was investigated. To date, this is the first study to examine the flossing frequency of periodontal patient.

According to the results of the study, there was no significant relationship between gender and flossing, but the percentage of women who flossed was higher than men. Also in previous studies, the evidences to prove the effectiveness of flossing on occurrence of periodontal disease wasn't sufficient (10, 11). But in many studies, the prevalence of chronic periodontitis, deep periodontal pockets, and attachment loss in men was higher than women. The reason can be that women pay more attention to oral hygiene and the higher daily use of dental floss in them (3,12-13). The cause of differences between the results of our study and these studies may be the difference in the level of people's socioeconomic status, the sample size and the inclusion and exclusion criteria of the studies.

As shown in the Fleming study (5), there was no significant relationship between age and daily flossing in the present study. However, according to the other studies, the severity of chronic periodontitis is higher in the elderly (3), which can be due to the occurrence of aging and the longer exposure of periodontal tissues to annoying factors over the time (14). This shows the importance of focusing on oral hygiene instructions in the middle-aged and older people.

In this study, a significant relationship was observed between flossing and periodontitis. None of the people who had flossed seven or more times a week had severe periodontitis. In fact, they had milder degrees of disease. Also, 90% of people with severe periodontitis did not use dental floss at all.

In the present study, there was significant relationship between flossing and diabetes and more than 90% of people with diabetes did not floss. But the link between diabetic conditions and periodontal disease has been proven in various studies and the

risk of periodontitis in diabetics is several times higher than in other people(6,15-17).

About smoking, there was no significant difference between smoking and flossing in chronic periodontitis patients. Thirty-seven percent of all smokers were current and former smokers, and most of these people did not use dental floss. Based on the results of previous studies it seems with increasing the duration of smoking, the loss of attachment increases (18). Also, smoking increases the risk of periodontal disease by 2.5 - 4 times and interferes with the healing of lesions, in a dose dependent way (19). Diabetes and smoking, respectively, can be considered as a systemic and environmental factor that has a great impact on the periodontal condition.

According to the findings of the present study, there is a significant relationship between the level of education and the severity of periodontitis. In fact, it has been suggested in the past that people with higher education have better gingival conditions. Also a higher prevalence of chronic periodontitis was observed at lower levels of literacy (4, 20,21).

In connection with the justification of the significant relationship observed between marriage and the severity of the periodontitis, we can mention socioeconomic problems and more mental preoccupation and lower level of health and education of married people than single people.

Although there is no significant relationship between visiting the dentist and the severity of the disease; the use of toothbrushes and flossing is associated with the severity of the disease and the severity of periodontitis increases with decreasing the frequency of brushing per week.

It seems that people consider oral hygiene to be a tedious, time consuming and costly task, and do not have a positive attitude towards the effect of these preventive behaviors in reducing tooth and gingival diseases and therapeutic costs and increasing the esthetic and quality of life in general. As a result, they are less likely to engage in oral hygiene practices such as tooth brushing and flossing. It may be possible to encourage patients to use these hygienic devices and perform the first level preventive hygienic behav

iors by recalling the benefits of toothbrushes and flossing and the lack of negative impact on gingiva and dental restorations. As in previous studies, informing people about the benefits of engaging in preventive behaviors as well as perceived barriers to doing so has had a positive effect (22-25).

Conclusion

The results of the present study show that the prevalence of flossing in men and women and different age groups in the Iranian population is the same, but in people with severe chronic periodontitis and people with diabetes is less than other people studied. It's recommended that the necessary planning be done to train and encourage these people to use dental floss.

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