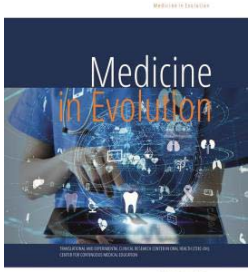
Patients' perception regarding the effects of smoking on periodontal health



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Abstract

R Smoking is one of the major risk factors for periodontal health, leading to higher progression rate of periodontitis and less predictable response to periodontal therapy. The aim of the present study was the assessment of patients' perception and level of knowledge regarding the effects of cigarette smoking over periodontal health. Material and method: the cross-sectional study was conducted in 2022 on a sample of 100 smokers using an on-line self-administered questionnaire. Results showed that 52% of participants were heavy smokers and only 57% would consider quitting if they were diagnosed with periodontitis. Signs and symptoms of periodontitis in smokers of which there were most frequently aware are halitosis (75%) and gingival recession (43%) rather than masked gingival bleeding (20%), tooth mobility (31%), bone resorption (20%) or periodontal abscess (23%). Regarding the risks for periodontal treatments in smokers, only reduced percentages of subjects were aware of impaired periodontal healing (24%), infection as complication (32%) and relapse (31%). Conclusion: Participants in the present showed a reduced level of awareness regarding the periodontitis signs and symptoms, a low level of knowledge regarding the potential risks of smoking over periodontal treatment and a low interest in quitting smoking because of periodontal issues.

Keywords: oral health, periodontal health, smoking, tobacco use, periodontal health perception

INTRODUCTION

Smoking is one of the common risk factors for both general and oral health [1], leading to reduced lifespan because of its negative effects on health [2]. In spite of the globally-applied programs and policies for tobacco control initiated and supported by the World Health Organization Framework Convention for Tobacco Control in 2003 [3], at the global level is still about one quarter of the population aged 15 years and older who smokes, with the prevalence of tobacco users decreasing from 32.7% in 2020 to 22,3% in 2020 [4].

Its negative effects on oral health are a consequence of both direct and indirect mechanisms because of the content of nicotine and other compounds, as well as the increase in the temperature it produces on the tissues in the oral cavity [5]. The decrease in oral mucosa vascularization [6], the suboptimal immunologic response [5-7], the potential for malignant transformation [5,8], impaired quality of mucosa [5], as well as the discoloration of the teeth surfaces and mucosa [9], as well as halitosis [10] are some of the important negative effects seen in smokers. Cigarette smoking is responsible for the increased risk for tooth loss twice higher compared to non-smokers [11]. Moreover, leukoplakia, which is the most frequently met premalignant lesion of oral mucosa, is seen 6 times most frequently in smokers [12].

When it comes to the association between smoking and periodontal disease, there is strong evidence to support the fact that cigarette smoking is one of the major risk factors for periodontal inflammation [13] and currently it is one of the criteria taken into consideration for the diagnosis of periodontitis, namely used to establish the grade of periodontitis [14]. There is a dose-dependent effect of cigarette smoking on periodontal disease [14-16] with the highest risk exposure among patients smoking at least 10 cigarettes per day, these being considered as heavy smokers, in comparison to light smokers who smoke <10 cigarettes per day [14,16]. Quitting smoking is of utmost importance in periodontal vulnerable or compromised patients [17] but formal smokers are still at risk compared to never smokers [16]. Exposure to smoking does not only influence the initiation and progression of periodontal inflammation but also the response to periodontal treatment, both initial therapy and surgical therapy [14,15,18]. Because of the bad prognosis of the surgical procedures in smokers because of the risk of poor wound healing [15,18], frequently heavy smokers are not good candidates for periodontal surgical corrective phase, thus the treatment is limited to pre-surgical, antimicrobial phase as active therapy and kept under supportive periodontal therapy phase, with a shorter follow-up intervals [18].

Aim and objectives

The aim of the present study was the assessment of patients' perception and level of knowledge regarding the effects of cigarette smoking over periodontal health.

MATERIALS AND METHODS

The Oral Health and Community Dentistry Department from the Faculty of Dental Medicine of the "Carol Davila" Medicine and Pharmacy University (Bucharest, Romania) conducted this cross-sectional study between March and June 2022. There were included 100 participants in the study, Romanian adults with an age varying between 20 and 63 years. The inclusion criteria were the current smoker status and a history of cigarette smoking of minimum 1 year. Exclusion criteria were professional field of dentistry, either dentist or dental student. The assessment was performed using an on-line questionnaire with 18 items, both open and close-ended questions. Participants in the study were informed that the forms

were anonymous, that no sensitive personal data were collected and were offered details about the aim of the study and their rights as participants in a study in accordance with the Declaration of Helsinki. All invited participants agreed to participate and proceeded to fill-in the forms.

RESULTS

Participants had a mean age of 31.9 ± 11.6 years and 42% (42 subjects) were females.

In the studied group, all the included participants were smokers with a history of cigarette smoking of 12.3 ± 9.1 years, on average. Heavy smokers (≥ 10 cigarettes/day) were 52% of subjects, light smokers (<10 cigarettes/day) were 26%, while 22% were occasionally smokers (Figure 1).

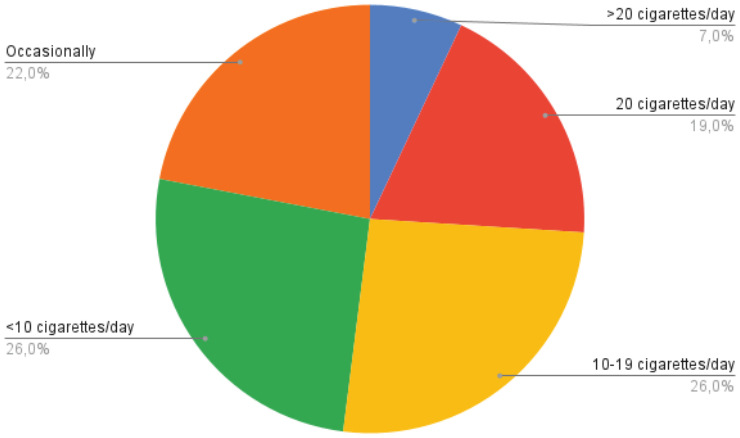

Figure 1. History of smoking among respondents

Among subjects included in the study, 63% declared having a previous attempt to quit smoking. Asked about medical reasons taken into consideration to quit smoking in the future in case of being diagnosed with different general and oral health issues, only 48% stated they would contemplate about quitting if they had gingivitis (as the first phase of periodontal tissues inflammation) and 57% if they had periodontitis (the deep and irreversible phase of periodontal inflammation) (Table 1). Higher percentages were observed for oral cancer and peri-implantitis as oral health-related reasons to give up cigarette smoking (Table 1). For general health conditions, 66% of subjects stated they would quit and 29% would contemplate giving up this habit only in the case of being diagnosed with a severe systemic disease (Table 1).

Table I. Attitude toward the contemplation of quitting smoking

Contemplating quitting smoking in case of developing different health condition	**% (N)**		
	Yes	**No**	**I don't know**
Frequency			
Gingivitis	48% (48)	17% (17)	35% (35)
Periodontitis	57% (57)	15% (15)	28% (28)
Dental caries	27% (27)	57% (57)	16% (16)

Contemplating quitting smoking in case of developing different health condition	% (N)		
	Yes	**No**	**I don't know**
Frequency			
Oral cancer	95% (95)	3% (3)	2% (2)
Peri-implantitis	66% (66)	17% (17)	17% (17)
Dental esthetic issues	52% (52)	24% (24)	24% (24)
	Yes	**No**	**Yes, only in severe systemic diseases**
Systemic diseases	66% (66)	5% (5)	29% (29)

When it comes to the clinical signs and symptoms specific for periodontitis to which they, as smokers, are prone, the most frequently mentioned answer was the halitosis (Figure 2). Basic and easy-to-be-observed by the patients symptoms, such as increased gingival bleeding (as the first signs of periodontal tissues inflammation) and reduced gingival bleeding (specific modification in smokers diagnosed with periodontal disease due to the microvascular dysfunction induced by tobacco use) are recognized by only 27% and 20% of the subjects (Figure 2). A low percent of participants were aware of the potential to develop more severe signs, such as bone resorption, periodontal abscess, tooth mobility and pathological tooth migration, which are characteristic for advanced forms of periodontitis (Figure 2).

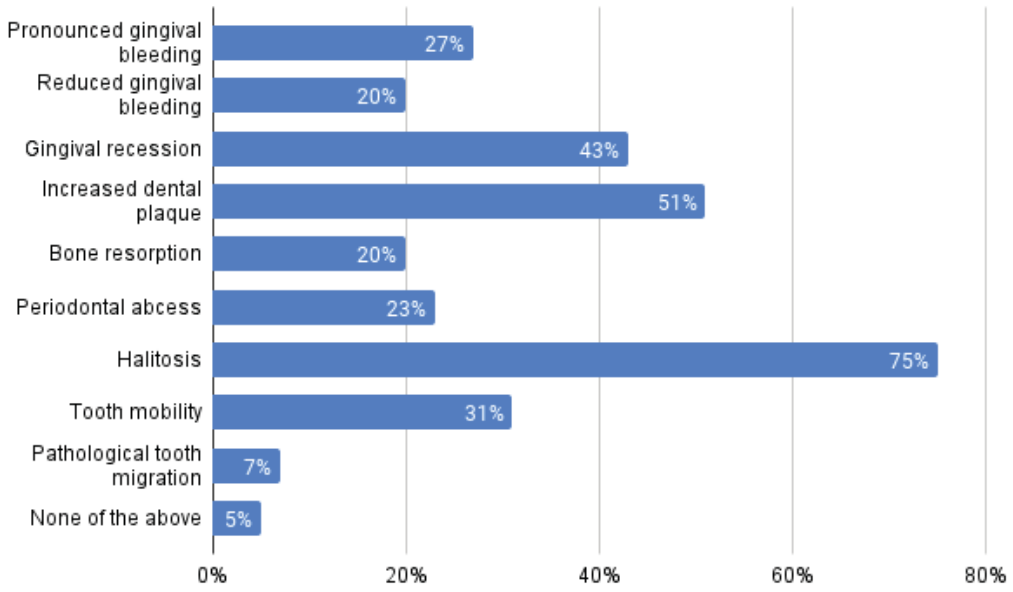

Figure 2. Acknowledgement of the periodontitis signs and symptoms among smokers

Regarding the risk to which these subjects, as current smokers, are exposed in case of developing periodontal disease and after active periodontal therapy, only 24% were aware of the compromised, partial response to periodontal treatment while 64% believed that the healing response is rather delayed (Figure 3). Infection, as the main complication after

periodontal surgical treatment, is declared as potential risk by only 32% of participants (Figure 3).

Unfortunately, even though smoking has a significant negative impact on maintenance phase after active periodontal treatment, only 31% of subjects were aware of this potential risk (Figure 3).

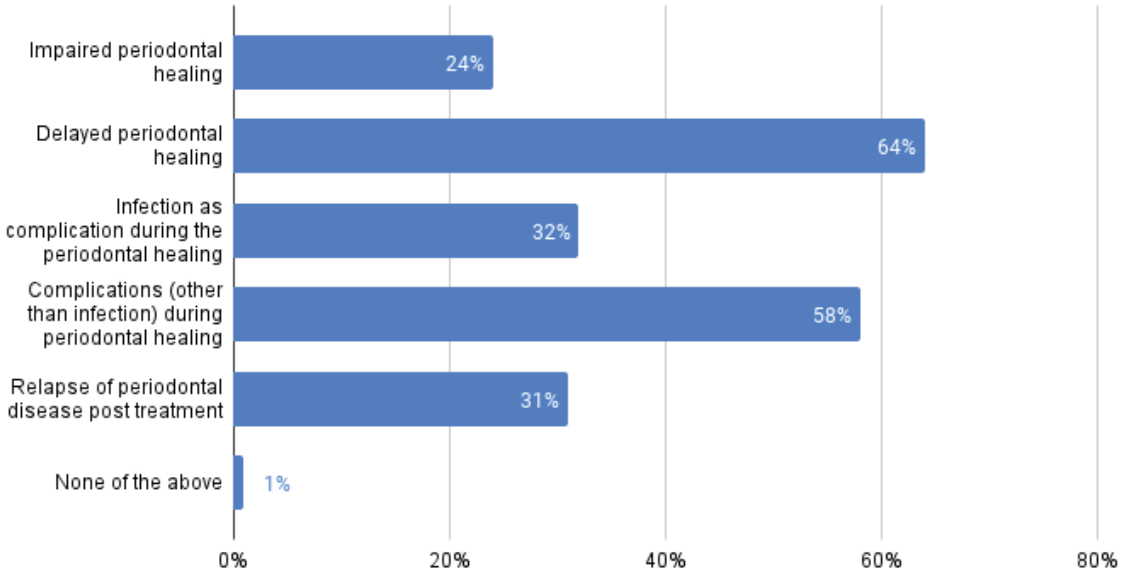

Figure 3. Acknowledgement regarding the potential effects of smoking after periodontal treatment

DISCUSSIONS

According to the most recently published Consensus over the Classification System of Periodontal and Peri-implant Diseases and Conditions [13], smoking status is one of the parameters used for periodontal diagnosis and it contributes to the setting of the stage of periodontitis, which is relevant to the progression of the periodontitis, namely the likelihood of greater rate of progression and a less predictably of response to periodontal treatment [19]. Thus, heavy smokers, which are current smokers of ≥ 10 cigarettes/day, are considered by default in Grade C of periodontitis, irrespective of the other risk factors, thus the greatest rate of progression and the least predictable outcome of the treatment. In our studied group, half of the participants were considered heavy smokers. However, the present study did not include clinical examination to identify the presence of periodontitis among the participants and the questionnaire did not include items regarding the personal history periodontal conditions or previous periodontal treatment.

Gingival bleeding is both a symptom often reported by periodontal patients and a sign known as bleeding on probing, which is one of the main clinical parameters and diagnostic criteria for gingivitis and periodontitis [13,14,19]. In our study, one quarter of the participants selected pronounced gingival bleeding as an answer for signs of periodontitis to which they, as smokers, are at risk. However, what is characteristic to cigarette smokers is the masked clinical signs such as gingival probing because of the microvascular constriction and fibrosis in spite of the presence of inflammatory infiltrate [13]. Thus, gingival bleeding is rarely observed in smokers, leaving the false impression of reduced inflammation. In our study, only one fifth of participants were aware that smokers could have reduced gingival bleeding in spite of the presence of periodontitis. And because of the absence or rarely seen bleeding,

smokers are at risk to be diagnosed belated, developing more advanced signs and symptoms such as tooth mobility and pathological tooth migration, bone resorption and periodontal abscesses (acute form of inflammation) but of which participants in our study are rarely aware of but are more likely to recognize gingival recession as potential symptom of periodontitis in smokers.

Because combusted tobacco use induces dysbiosis, reduced gingival perfusion, increased inflammatory response because of suppressed immune response, decreased expression of angiogenic factors, impaired morphological and functional recovery of periodontal tissues [20], smokers are at a higher risk of early debut of periodontitis, higher rate of progression, improper response to either non-surgical or surgical periodontal therapy and relapse after the active treatment [15,19]. However, among the assessed participants, these risks are acknowledged by low percentages.

Quitting smoking is recommended in case of periodontal patients who smoke and counseling the patients by the dental professional is encouraged as part of periodontal therapy [17,19] although previous research showed that the rate of quitting varies between 4% and 30% among patients affected by periodontitis, after various behavioral change intervention [17]. In addition, the benefits of quitting smoking with the purpose of reduction of risk over periodontal health at a level of non-smokers could be seen in 10 up to 20 years after giving up this habit [11].

The fact that only about one half of the subjects in the present study would consider quitting smoking in case they get to be affected by gingivitis and periodontitis could be explained by these reduced levels of knowledge and awareness regarding the symptoms and risk over periodontal health and therapy.

CONCLUSIONS

In the present study, participants, predominantly heavy smokers, showed a reduced level of awareness regarding the periodontitis signs and symptoms, a reduced level of knowledge regarding the potential risks of smoking over periodontal treatment and a low interest in quitting smoking because of periodontal issues.

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