

The Impact of Tobacco Smoking on Oral Health - An Observational Study

Mimoza Canga^{a*}, Irene Malagnino^b, Edit Xhajanka^c, Ruzhdie Qafmolla^d,

Vito Antonio Malagnino^e

^a*Department of Nursing, Faculty of Public Health, University "Ismail Qemali", Vlova, 9401, Albania*

^b*Malagnino Associated Medical Clinic, Rome, 00144, Italy*

^{c,d}*Department of Dental Prosthesis, University of Medicine Tirana, Nr. 183 Tirana, 1001, Albania*

^e*Endodontic Chair, University "Gabriele D'Annunzio" Chieti, 66100, Italy*

^a*Email: mimoza-canga@hotmail.com*

Abstract

Cigarette smoking is a major cause of a high number of diseases including oral diseases. The aim of the present study was to evaluate the impact of smoking on oral health. This is an observational study. In the present research were taken into consideration 200 young adults with an age range of 18 to 25 years old, of which 58% were males and 42% were females. The study found a strong correlation between smoking and very bad gingival status ($P = .001$; 95% CI 0.42-0.53), missing teeth ($P = .001$; 95% CI 0.35-0.45), dental caries ($P = .001$; 95% CI 0.36-0.43), and inflammation of the lips ($P = .001$; 95% CI 0.33-0.57).

Keywords: Cigarette smoking; dental caries; gingival status; lip inflammation; missing teeth; young adults.

1. Introduction

Cigarette smoking is a risk factor for the development of many illnesses such as cardiovascular diseases, chronic obstructive lung diseases, cancers of the mouth, and esophagus. Tobacco smoking rates among adults and children in developing countries have been increasing significantly [1]. According to a study conducted by Nazir MA et al, the prevalence of tobacco use in adolescents in 133 countries was 19.33%, and it ranged from 1.5% to 65.5% [2].

Tobacco smoking use is recognized as the most noteworthy risk factor for oral diseases [3]. Moreover, studies conducted by Papapanou PN et al, and Chapple IL, found that smoking increased the risk of gingival inflammation [4-6]. Likewise, a study conducted by Tanaka K et al, proved that smoking was the cause of various diseases, including dental caries [7, 8].

* Corresponding author.

Other clinicians found a direct correlation between smoking and lips pigmentation [9, 10]. The recent literature states that young people who lived with members of their family who were daily smokers had serious problems with their health [11].

Corsi DJ et al, declared that 12% of Canadian youth aged 15 to 19 years old were smokers, meanwhile Woodgate RL et al, demonstrated that adolescent females by observing their parents who smoked had easier access to buy and consume tobacco [12, 13].

In Pierce and his colleagues study, it is observed that the number of young adult smokers aged 18 to 29 years old who consumed less than 5 cigarettes per day is increased from 4.7% to 6.0% [14].

The present study sets out to assess the impact of tobacco smoking on oral health.

2. Material and method

This is an observational study. The current study was conducted in the period from 2019 to 2021, in Albania. In the present research were taken into consideration 200 young adults with an age range of 18 to 25 years old, of which 58% were males and 42% were females. Data collection was done using questionnaires. The questionnaire contained information about gender, age range, current smokers, and the number of smokers in the family. The questionnaire included the habits of tobacco consumption in the participants and the characteristics of the sample such as gingivitis, dental caries, missing teeth, and diseases of the lips smoking-related. The questionnaire was designed based on the resolution of the Albanian National Committee no. 9, dated 11.11.2011. The duration of the questionnaire lasted 20 minutes and the anonymity of the participants was preserved. The original research was conducted according to the guidelines of the Helsinki statement [15]. Based on the Helsinki Declaration approved by the World Medical Association the present study participants were current smokers or former smokers. The participants had the right to withdraw at any time. There was no withdrawal of the patients from the study. The inclusion criteria were the age of participants over 18 years old. Participant exclusion criteria were diabetic patients. The present study is an attempt to demonstrate the impact of smoking on oral health, assessing the association of smoking with gingivitis, dental caries, missing teeth, and lips inflammation. Descriptive analysis was performed using percentages for qualitative variables such as gender, age range, smoking, number of smokers in the family, daily routine, smoking over time, number of cigarettes per day, gingival status, missing teeth, dental caries, and diseases of the lips smoking-related. Statistical analysis was performed using IBM SPSS 23.0 statistics, Microsoft Windows Linux, Chicago, IL, USA. Data were analyzed by Post Hoc LSD test in variance analysis (ANOVA). The significance level (α) was set at 0.05, with a confidence interval (CI) of 95%.

3. Results

The majority of the participants in the study belonged to the age range from 21 to 25 years old, respectively 70.5% of them, while 12% of the participants were from 19 to 20 years old. The results of our study showed that 70% of the participants were current smokers. Based on the present research it resulted that 51% of the participants had one smoker in the family, whereas 31 % of the patients had two smokers in the family.

The results were detailed in Table 1.

Table 1: Socio-demographic characteristics of the sample.

Variables	Percentage
Female	42%
Male	58%
Age range	
18-19	9.5%
19-20	12%
20-21	8%
21-25	70.5%
Smoking	
Current smokers	70%
Former smokers	30%
Number of smokers in the family	
1 smoker	51%
2 smokers	31%
3 smokers	18%

A high percentage of the participants reported smoking in the morning 31% of them, and 28% of the participants reported smoking after lunch. In this study, 51% of the participants declared, that they smoking for more than 5+ years. It resulted that 43% of the sample smoked 10-20 cigarettes per day. The results were presented in Table 2.

Table 2: The habits of tobacco consumption among participants.

Variables	Percentage
Smokers - Daily Routines	
In the morning	31%
After lunch	28%
Smoking associated with coffee consumption	21%
Before bedtime	8.5%
Night smokers	11.5%
Smoking use over time	
1-2 years	17%
3-4 years	20%
4-5 years	12%
5+ years	51%
Number of cigarettes smoked per day	
3-5	22%
5-10	35%
10-20	43%

Based on the results of the current study it was observed that 43.5% of participants had bad gingival status, and 34.5% of them had very bad gingival status.

The findings of the study show that 46.5% of the participants had lost 1-2 teeth and 44% of them had lost 2-3 teeth. The current study showed that 55% of patients had 2-3 teeth with dental caries, 27% of the patients had more than 3 teeth with caries and 18% of them had 1-2 dental caries. According to study data, 34% of the participants declared, that they had lips pathology. The results were presented in Table 3.

Table 3: Oral health status related to cigarette smoking.

Gingival status	Percentage
Good	22%
Bad	43.5%
Very bad	34.5%
Missing teeth	
1-2	46.5%
2-3	44%
3+	9.5%
Dental caries	
1-2	18%
2-3	55%
3+	27%
Smoking-related to lips inflammation	
Yes	34%
No	66%

According to the ANOVA test, smoking was strongly correlated with very bad gingival status (P= .001; 95% CI 0.42-0.53), missing teeth (P= .001; 95% CI 0.35-0.45), and dental caries (P= .001; 95% CI 0.36-0.43).

This study showed that there is a statistically significant correlation between smoking and lips inflammation (P= .001; 95% CI 0.33-0.57). The results were detailed in Table 4.

Table 4: The correlation between cigarette smoking and oral health.

Smoking			
Variables	P-value	95% Confidence Interval	
Gingival status	.001	.42	.53
Missing teeth	.001	.35	.45
Dental caries	.001	.36	.43
Smoking-related to lips inflammation	.001	.33	.57

4. Discussions

The aim of this observational study was to show the impact of smoking on oral health diseases. According to the data from the study conducted by Toljamo T et al, it was demonstrated that young male smokers aged from 18 to 26 years old were nicotine-dependent, 95.3% of them [16]. On the other hand, as reported by the present study, most of the participants, 58% of them were young male smokers. Some studies suggest that that smoking in young adults is influenced by family members [17-19]. Similarly, the current study demonstrated that almost half of the participants, 51% of them had in the family at least one smoker.

The results of the cross-sectional analysis carried out by Barrington-Trimis JL et al, demonstrated that among young adults in the US in 2018, 42.6% began smoking at the age of 18 years or older [20]. According to the latest data published by the Institute of Public Health in Albania, the prevalence of adult smokers (18 years and older) is higher, especially for men, 58.8%.

In this study, 31% of the participants stated that they smoke in the morning. Our results are similar to the findings of the study conducted by Haberstick et al, who also noticed that smoking the first cigarette in the morning may be the most highly encountered habit among young adults [21]. The present study, reports that 43.5% of the participants had bad gingival status and 34.5% of them had very bad gingival status and is in agreement with studies conducted by Rösing CK et al, and Holde GE et al, who proved that smoking was associated with increased gingival complications [22,23]. On the basis of our data, exists a significant correlation between smoking and dental caries, and our results are supported by the study carried out by Wagenknecht DR and his colleagues [8]. The current study demonstrated that smoking has a significant impact on the manifestation of lips inflammation P-value= .001. Other studies have had similar findings [9,24].

Smoking is a serious risk factor for missing teeth. During analyze of data, we found that 46.5% of the participants had 1-2 missing teeth. Similarly, a systematic review conducted by Hanioka T et al, has confirmed that smoking is associated with tooth loss [25]. We emphasize that, one of the main objectives of the Albanian government is the implementation of the anti-tobacco law, which aims through an information and awareness campaign to control and monitor measures to protect health from tobacco smoking. Data from the current study do support the idea that dentists have an important role in encouraging patients to stop smoking in order to improve their health status. Participants in the study claimed that they had a need for smoking as routine, and that has developed a social environment among them. The limitation of this study was the age range from 18 to 25 years and did not include adolescents younger than 18 years and adults over 25 years old. The recommendation of this study is quitting cigarette smoking is beneficial for smokers of any age, especially among young people.

5. Conclusions

The study found a strong correlation between smoking and very bad gingival status, missing teeth, dental caries, and lip inflammation.

Disclosure

All authors declare that they have no conflicts of interest.

References

- [1]. U.S. Department of Health and Human Services: Preventing tobacco use among youth and young adults: A report of the Surgeon General. 2012, Atlanta, GA: U.S: Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- [2]. Nazir MA, Al-Ansari A, Abbasi N, Almas K. Global Prevalence of Tobacco Use in Adolescents and Its Adverse Oral Health Consequences. Open Access Maced J Med Sci. 2019 Oct 11; 7(21):3659-3666.
- [3]. Silva H. Tobacco Use and Periodontal Disease-The Role of Microvascular Dysfunction. Biology (Ba-

sel). 2021 May 17; 10(5):441.

[4]. Papapanou PN, Sanz M, Buduneli N, Dietrich T, Feres M, Fine DH, et al. Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J ClinPeriodontol*. 2018 Jun; 45 Suppl 20:S162- 70.

[5]. Chapple IL, Mealey BL, Van Dyke TE, Bartold PM, Dommisch H, Eickholz P, et al. Periodontal health and

Gingival diseases and conditions on an intact and a reduced periodontium: Consensus report of workgroup 1 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J ClinPeriodontol*. 2018 Jun; 45 Suppl 20:S68-77.

[6]. Li Y, Lee S, Hujoel P, Su M, Zhang W, Kim J, et al. Prevalence and severity of gingivitis in American adults. *Am J Dent*. 2010 Feb; 23(1):9-13.

[7]. Tanaka K, Miyake Y, Sasaki S, Ohya Y, Miyamoto S, Matsunaga I, Yoshida T, Hirota Y, Oda H, Maternal TO, Child Health Study Group. Active and passive smoking and tooth loss in Japanese women: baseline data from the osaka maternal and child health study. *Annals of epidemiology*. 2005 May 1; 15(5):358-64.

[8]. Wagenknecht DR, BalHaddad AA, Gregory RL. Effects of nicotine on oral microorganisms, human tissues, and the interactions between them. *Current Oral Health Reports*. 2018 Mar; 5(1):78-87.

[9]. Haresaku S, Hanioka T, Tsutsui A, Watanabe T. Association of lip pigmentation with smoking and gingival melanin pigmentation. *Oral diseases*. 2007 Jan; 13(1):71-6.

[10]. Multani S. Interrelationship of Smoking, Lip and Gingival Melanin Pigmentation, and Periodontal Status *Addict Health*. 2013 Winter-Spring; 5(1-2): 57–65.

[11]. Putri PD, Susanto AD, Hudoyo A, Nurwidya F, Taufik FF, Andarini S, Antariksa B. Correlation between domestic cigarette smoke exposure and respiratory complaints, hospitalization and school absence due to respiratory complains in the Indonesian elementary school-aged children. *International Journal of Applied and Basic Medical Research*. 2018 Oct; 8(4):244.

[12]. Corsi DJ, Lear SA, Chow CK, Subramanian SV, Boyle MH, Teo KK. Socioeconomic and geographic patterning of smoking behaviour in Canada: a cross-sectional multilevel analysis. *PLoS One*. 2013 Feb 28; 8(2):e57646.

[13]. Woodgate RL, Kreklewetz CM. Youth's narratives about family members smoking: parenting the parent-it's not fair. *BMC Public Health*. 2012 Dec; 12(1):1-3.

[14]. Pierce JP, White MM, Messer K. Changing age-specific patterns of cigarette consumption in the Unit-

- ed States, 1992–2002: association with smoke-free homes and state-level tobacco control activity. *Nicotine & Tobacco Research*. 2009 Feb 19; 11(2):171-7.
- [15]. World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *Jama*. 2013 Nov 27; 310(20):2191-4.
- [16]. Toljamo T, Hamari A, Nieminen P, Kinnula VL. Young male daily smokers are nicotine dependent and experience several unsuccessful quit attempts. *Scandinavian Journal of Primary Health Care*. 2012 Sep 1; 30(3):183-8.
- [17]. Passey ME, Gale JT, Sanson-Fisher RW. “It’s almost expected”: rural Australian Aboriginal women's reflections on smoking initiation and maintenance: a qualitative study. *BMC Women's Health*. 2011 Dec; 11(1):1-2.
- [18]. Mak KK, Ho SY, Day JR. Smoking of parents and best friend—-independent and combined effects on adolescent smoking and intention to initiate and quit smoking. *Nicotine & Tobacco Research*. 2012 Sep 1; 14(9):1057-64.
- [19]. Janz T. Current smoking trends. *Health at a Glance*. Statistics Canada Catalogue. 2012(82-624).
- [20]. Barrington-Trimis JL, Braymiller JL, Unger JB, McConnell R, Stokes A, Leventhal AM, Sargent JD, Samet JM, Goodwin RD. Trends in the Age of Cigarette Smoking Initiation Among Young Adults in the US From 2002 to 2018. *JAMA Netw Open*. 2020 Oct 1; 3(10):e2019022.
- [21]. Haberstick BC, Timberlake D, Ehringer MA, Lessem JM, Hopfer CJ, Smolen A, Hewitt JK. Genes, time to first cigarette and nicotine dependence in a general population sample of young adults. *Addiction*. 2007 Apr; 102(4):655-65.
- [22]. Rösing CK, Gomes SC, Carvajal P, Gómez M, Costa R, Toledo A, Solanes F, Romanelli H, Gamonal J, Oppermann RV. Impact of smoking on gingival inflammation in representative samples of three South American cities. *Braz Oral Res*. 2019 Sep 16; 33:e090.
- [23]. Holde GE, Jönsson B, Oscarson N, Müller HP. To what extent does smoking affect gingival bleeding response to supragingival plaque? Site-specific analyses in a population-based study. *J Periodontal Res*. 2020 Apr; 55(2):277-286.
- [24]. Mirbod SM, Ahing SI. Tobacco-associated lesions of the oral cavity: Part I. Nonmalignant lesions. *J Can Dent Assoc*. 2000 May; 66(5):252-6.
- [25]. Hanioka T, Ojima M, Tanaka K, Matsuo K, Sato F, Tanaka H. Causal assessment of smoking and tooth loss: a systematic review of observational studies. *BMC public health*. 2011 Dec; 11(1):1-0.