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Knowledge and awareness of Libyan dental patients regarding the adverse effects of tobacco smoking on oral health

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Highlights

- Tobacco smoking and periodontitis are still major public health problems.
- Non-smokers have significantly more knowledge about the adverse effects of tobacco smoking on oral and periodontal health when compared to smokers.
- Smoking cessation should be an essential part of periodontal therapy.
- Dental professionals can offer smoking cessation counseling to their patients and support them to quit smoking.

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ABSTRACT

Background: Tobacco smoking and periodontitis are still major public health problems. The role of tobacco smoking in the progression and severity of periodontal diseases has been emphasized. The current study aimed to investigate the awareness and knowledge of dental patients regarding the adverse effects of tobacco smoking on “oral and periodontal health” in Benghazi, Libya.

Materials and Methods: “A cross-sectional study” was undertaken in several dental practices. The study involved 179 participants which Comprised of 48 smokers and 131 non-smokers. Participants were interviewed and inquired to answer a questionnaire related to awareness and knowledge about the adverse effects of tobacco smoking on oral health.

Results: Significantly higher percentages of non-smokers were conscious about the adverse effects of tobacco smoking on oral health ($p=0.002$), whereas no statistically significant differences were found among male and female participants, although females were more conscious about the adverse effects of tobacco smoking on oral health.

Conclusions: The results of the current study reveal that non-smokers have significantly more knowledge about the adverse effects of tobacco smoking on “oral and periodontal health” when compared to smokers. “Smoking cessation” should be an integral part of periodontal treatment and dental professionals can offer “smoking cessation” counseling to their patients and support them to quit tobacco smoking.

1. Introduction

The role of tobacco smoking in many diseases is well documented and its major role in the progression and severity of periodontal diseases has been emphasized (Lung *et al.*, 2005). Tobacco smoking is generally considered the most significant modifiable risk factor for periodontal disease, moreover, tobacco smoking has been shown to increase the severity and progression of periodontal disease (Mullally, 2004; Borojevic, 2012; Marina *et al.*, 2015; Matos *et al.*, 2016; Kasmikha, 2017; Ziukaite *et al.*, 2017; Leite *et al.*, 2018; Omarn, Akram and Khairi, 2018; Jiang *et al.*, 2020). Smokers with chronic periodontitis tend to have more attachment and bone loss, more furcation involvements and deeper pockets, and show less bleeding on probing than nonsmokers. Additionally, they seem to form more supragingival and less subgingival calculus (Laxman and Annaji, 2008; Zee, 2009; Sreedevi, Ramesh and Dwarakanath, 2012). Furthermore, Tobacco smoking also delays periodontal wound healing (Terrades *et al.*, 2009; Elburki, 2015). Moreover, Smokers tend to respond less favorably to periodontal treatment and more often present with refractory periodontitis (Lung *et al.*, 2005; Gautam *et al.*, 2011; Bassetti *et al.*, 2017), therefore, periodontal treatment should be aimed at making the patient aware of tobacco smoking effects on periodontal tissues (Musani, 2010).

It is worth noting that patients who used to smoke have less risk for developing the periodontal disease compared to the current smokers, however, they are at more risk compared to non-smokers, and that the risk for periodontal disease development declines with the cumulative years since “smoking cessation” (Abu-Ta’a, 2014). Also, it has been well established that there is a close-response relationship between tobacco smoking and the risk of the development of oral cancer (Zhang *et al.*, 2019).

Evaluating patients’ knowledge about the adverse effects of tobacco smoking on “oral and periodontal health” is essential in taking the decision to apply preventive measures and can help dentists in patient’s education about the adverse effects of tobacco smoking on periodontal health (Singhal, 2016).

The current study aimed to investigate the dental patient’s awareness and knowledge of the adverse effects of tobacco smoking on “oral and periodontal health” in Benghazi, Libya.

2. Materials and Methods

“A cross-sectional study” was undertaken in 2019. Participants were selected from patients seeking periodontal treatment in three dental clinics of the private sector in Benghazi/Libya. The nature and intention of the study were clarified to the patients and invited

to take part in the study. Ethical approval was acquired from the committee of ethics at the Faculty of Dentistry, the University of Benghazi, and informed consent was obtained from each participant. The study was comprised of 179 participants (48 smokers and 131 non-smokers) aged 18 to 66 years. Participants were interviewed in the dental clinic and inquired to answer a questionnaire that included mainly closed-ended questions. The questionnaire comprised 21 questions translated to the Arabic language. The questionnaire involved “socio-demographic” details such as age, gender, and level of education. Subsequently, information about smoking status, duration, frequency, and the smoking type was obtained followed by information regarding the level of awareness and knowledge about the adverse effects of tobacco smoking on oral health. The questionnaire was a modification of those used previously by (Lung et al., 2005; Tin-Oo et al., 2013; Ashwin, 2015; Singhal, 2016).

3. Statistical analysis

Data were analyzed using Excel statistical software. Descriptive statistics including means, standard deviations, and percentages were used to summarize the results. Awareness and knowledge differences among smokers and non-smokers were evaluated by using Fisher's exact test; the statistically significant value was set at $p \leq 0.05$.

4. Results

The mean age of the participants was 37.5 ± 10.21 years, out of 179 participants who joined the study 87 (48.6%) were females and 92 (51.4%) were males. Out of 179 participants, 48 (26.8%) were cigarette smokers, and out of which 52.2% of the entire males who joined the study were smokers and 47.8% were non-smokers, whereas no females smoked (Fig. 1).

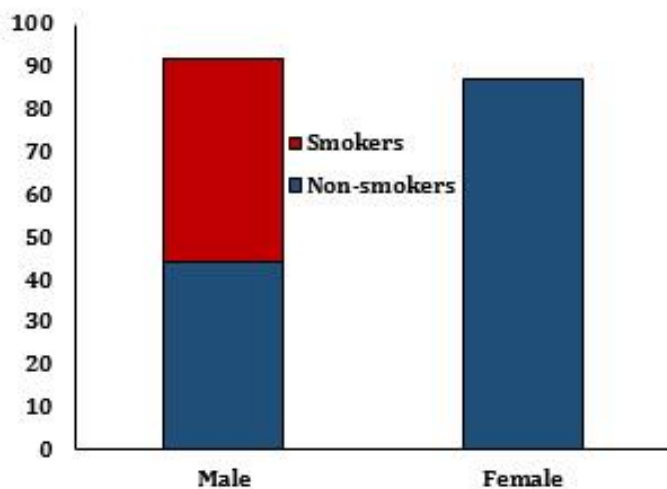


Fig. 1. Gender and tobacco smoking status

The level of education and tobacco smoking status is shown in Fig. 2. The results of the current study revealed that the habit of tobacco smoking among college graduates is more popular (52%) followed by high school graduates (35.4%) and middle school graduates (12.5%) (Fig. 2). Regarding patient's awareness of the adverse effects of tobacco smoking on oral health, 92.7% of the participants were aware that tobacco smoking had negative impacts on periodontal health. Both smokers and non-smokers believed that tobacco smoking is a risk factor for oral cancer (82.7%) and early tooth loss (82.7%). The majority of the participants were aware that tobacco smoking causes halitosis (97.8%), staining of teeth (96.6%), black lip (91.6%), black gum (90.5 %), and deposits (88.3%). Nevertheless, fewer participants were conscious of the additional adverse effects for instance inflammation of the gingiva (71.5%), change in taste and smell (69.8%), and “delayed wound

healing” (51.4%). In addition, 48.6% of the participants were not aware that tobacco smoking can result in “delayed wound healing”, and 56.4% of the participants recognized that tobacco smoking is not related to dental caries (Fig. 3).

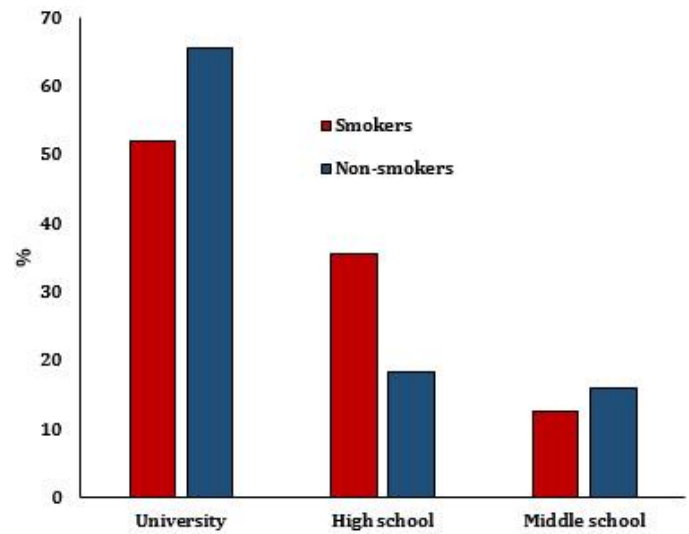


Fig. 2. Level of education and tobacco smoking status

Regarding patient's awareness of the adverse effects of tobacco smoking on oral health, 92.7% of the participants were aware that tobacco smoking had negative impacts on periodontal health. Both smokers and non-smokers believed that tobacco smoking is a risk factor for oral cancer (82.7%) and early tooth loss (82.7%). The majority of the participants were aware that tobacco smoking causes halitosis (97.8%), staining of teeth (96.6%), black lip (91.6%), black gum (90.5 %), and deposits (88.3%). Nevertheless, fewer participants were conscious of the additional adverse effects for instance inflammation of the gingiva (71.5%), change in taste and smell (69.8%), and “delayed wound healing” (51.4%). In addition, 48.6% of the participants were not aware that tobacco smoking can result in “delayed wound healing”, and 56.4% of the participants recognized that tobacco smoking is not related to dental caries (Fig. 3).

Males who smoked were more expected to be aware that tobacco smoking causes inflammation of gum (87.5%) and change in taste and smell (85.4%), whereas non-smokers females were more expected to be alert that tobacco smoking causes oral cancer (81.6%) and delayed wound healing (50.6%). Awareness of the adverse effects of tobacco smoking on oral health by males and females, smokers and non-smokers is shown in Table 1.

Significantly higher percentages of non-smokers were alert of the adverse effects of tobacco smoking on oral health ($p=0.002$), whereas no significant differences were found between male and female participants, although females were more conscious of the adverse effects of tobacco smoking on oral health (Table 1).

5. Discussion

Tobacco smoking and periodontitis are still major public health problems (Bassetti et al., 2017). Within the past thirty years, there has been growing awareness of the impact of tobacco smoking on periodontal tissues (Gautam et al., 2011). It is currently well acknowledged that tobacco smoking is considered one of the most preventable risk factors in the incidence and severity of periodontal diseases (Mullally, 2004; Kasmikha, 2017; Leite et al., 2018). This suggests that the adverse effects of tobacco smoking on periodontal disease severity can be reversed with “smoking cessation” and that “smoking cessation” programs should be an essential part of periodontal therapy.

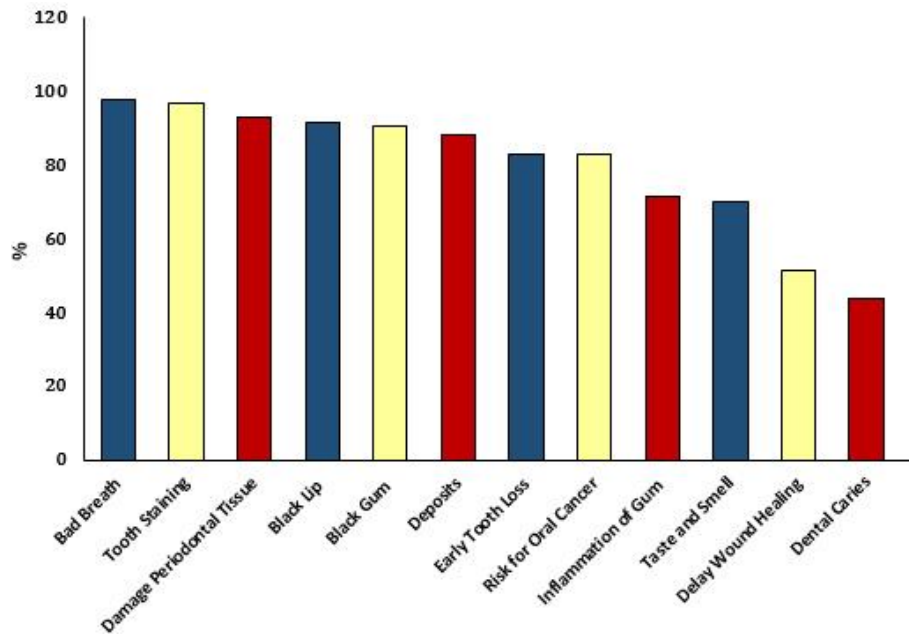


Fig. 3. Patient's knowledge of the adverse effects of tobacco smoking on oral health status.

Table 1

Awareness of the adverse effects of tobacco smoking on oral health according to gender and tobacco smoking status.

Effects of tobacco smoking on oral health	Gender		Smoking status	
	Male (%)	Female (%)	Smoker (%)	Nonsmoker (%)
Tooth loss	79.3	86.2	95.8	98.5
Bad breath	97.8	97.7	93.7	97.7
Tooth staining	94.6	98.8	58.3	74.0
Taste and smell	65.2	74.7	85.4	81.7
Oral cancer	83.7	81.6	50	51.9
Delay wound healing	52.2	50.6	47.9	41.9
Dental caries	36.9	50.6	56.2	77.1
Inflammation of gum	69.6	73.6	87.5	88.5
Deposits	85.9	90.8	87.5	91.6
Black gum	91.3	89.6	91.7	91.6
Black lip	92.4	90.8	14.6	12.9
Damage periodontal tissue	88	97.7	75	85.5
P-value	0.6		0.002*	

*: statistically significant

The current study was carried out on a convenience sample of patients seeking periodontal treatment in dental clinics of the private sector and therefore, the majority of the participants come from a selected group, involving people more alert of and more expected to afford dental treatment. "A cross-sectional study" was undertaken with 179 participants to investigate the dental patient's awareness and knowledge regarding the adverse effects of tobacco smoking on "oral and periodontal health" in Benghazi, Libya. The mainstream of the subjects in the study were males (51.4%). Among these, 26.8% smoked and 73.2% were non-smokers, whereas no females smoked (48.6%). This possibly because of the public image that women should not smoke since tobacco smoking in Libya is considered socially unacceptable for religious and cultural reasons. Although, the lower prevalence of tobacco smoking among females should be interpreted with caution because of the possibility of underreporting or withholding information by female participants due to taboo issues. Increased frequency of tobacco smoking among males maybe because of job-related stress, although it cannot be recognized as the only motive for tobacco smoking (Singhal, 2016). Tobacco smoking is found to be prevalent among university graduate people. It might be due to the

superior socio-economic status of people with a higher level of education. However, the higher prevalence of tobacco use among males should be interpreted with caution since recent studies have shown that in Arab countries there is an increasing prevalence of tobacco use among females especially the new trends of tobacco use such as waterpipe smoking (Dar-Odeh and Abu-Hammad, 2011).

The finding that education is correlated with tobacco use could be utilized in antismoking activities since educated smokers may be more receptive to awareness programs, hence specific campaigns that target educated smokers can be designed (Dar-Odeh et al., 2013). When we evaluated awareness of the impacts of tobacco smoking on "oral and periodontal health" we realized that most participants were conscious about the impacts of tobacco smoking on bad breath (97.8%), tooth staining (96.6%), and oral cancer (82.7%). These effects were also acknowledged by most participants in several studies performed in the United Kingdom, Nigeria, Myanmar, Kingdom of Saudi Arabia, and India (Lung et al., 2005; Nwhator et al., 2010; Tin-Oo et al., 2013; Ashwin, 2015; Singhal, 2016).

Previous clinical studies have also confirmed the correlation between smoking and halitosis even in non-cigarette smoking modalities like waterpipe smoking (Al-Humaidi et al., 2017). Moreover, we recognized that 50% of smokers compared to 52% of non-smokers were conscious that smoking is recognized as a risk factor for oral cancer development, these findings indicate that the awareness among dental patients about oral cancer was better when compared with previous studies (Lung et al., 2005; Nwhator et al., 2010; Ashwin, 2015). This has serious implications in increasing the possibility of developing oral cancer in a susceptible population of smokers.

In the current study, the majority of our participants were familiar with the link between smoking and the destruction of periodontal tissues (92.7%); however, non-smokers were more familiar than smokers with the link between periodontal disease and smoking. Again, this finding indicates that smokers should be targeted by oral health professionals to increase their awareness of the adverse impact of smoking on oral mucosa with particular reference to periodontal tissues.

Even though a causative relationship has not yet been recognized between smoking and tooth loss, 82.7% of our participants, particularly non-smokers, were alert of this consequence. Only 51.4% of our participants were conscious of the relationship between smoking and “delayed wound healing”, with no major difference between smokers and non-smokers. In contrast, non-smokers in India were considerably more conscious than smokers of the link between smoking and wound healing (Singhal, 2016). This has implications for the smoker dental patient who undertakes oral surgical procedures including dental extraction, surgical biopsy, and others (Ozkan et al., 2014).

Alterations in taste and smell are common adverse effects of tobacco smoking (Da Ré et al., 2018). A study done in Germany revealed that 20 or more cigarettes smoked per day were significantly related to diminished taste and smell (Vennemann, Hummel, and Berger, 2008). In the current study 69.8% of our participants, were conscious about the alterations in smell and taste as a result of tobacco smoking, with a higher percentage of smokers compared to non-smokers who were alert. Nevertheless, we could not conclude whether this awareness was correlated with their experience with tobacco smoking or due to other reasons.

The findings of the current study emphasize patient’s lack of awareness of the adverse effects of tobacco smoking on wound healing and highlight the role dental professionals, along with medical professionals can play in educating and informing patients about the risks of tobacco use. In the current study, awareness of dental patients regarding adverse effects of tobacco smoking on “oral and periodontal health” was high in contrast to previous studies (Lung et al., 2005; Nwhator et al., 2010; Tin-Oo et al., 2013; Ashwin, 2015).

Even though this is “a cross-sectional study” and the sample size is relatively small, however, to the best of our knowledge the current study is the first to report on the awareness of Libyan dental patients regarding the adverse effects of tobacco smoking on oral health. Within the limitations of this study, the results of the current study show that smokers have significantly less awareness about the adverse effects of tobacco smoking on “oral and periodontal health” as compared to non-smokers. More studies need to be conducted with a larger sample size covering more geographical areas in Libya.

6. Conclusions

The results of the current study reveal that non-smokers have significantly more knowledge about the adverse effects of tobacco smoking on “oral and periodontal health” when compared to smokers. Patient’s awareness of the effect of tobacco smoking on oral health status is vital in decision making to apply measures for prevention. Moreover, dentists have an essential role in assessing patient’s awareness regarding the adverse effects of tobacco smoking

on oral health and educate the patients regarding the negative impacts of tobacco smoking on periodontal health as well as about the benefits of “smoking cessation” to the treatment. Therefore, “smoking cessation” should be a fundamental part of periodontal treatment and dental professionals can offer “smoking cessation” counseling to their patients and support them to quit smoking, and close collaboration with physicians is highly recommended in the treatment of smoking patients.

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