AWARENESS OF PERIODONTAL HEALTH AND SYSTEMIC RISK FACTORS AMONG DENTAL STUDENTS – A SURVEY STUDY

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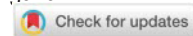
Abstract: Periodontal diseases have significant public health importance due to their widespread prevalence. Periodontitis is a chronic disease with common social determinants and risk factors with a range of systemic diseases and conditions. The relationship between periodontal and systemic health underscores the necessity for dental practitioners to have a thorough understanding and awareness of the impact of systemic risk factors on the development of periodontal diseases. The purpose of this study is to examine the awareness of periodontal diseases and their connection with systemic diseases and conditions among dental students. A sociological research method was employed - a survey conducted among 160 students at the Faculty of Dental Medicine in Sofia. A standardized questionnaire containing 22 questions was used, addressing the causes, progression and consequences of periodontal diseases and associated systemic risk factors. The results showed a good level of awareness among students regarding the etiology, symptoms and treatment of periodontal diseases. At the same time, certain gaps in knowledge were identified, particularly related to the role of systemic risk factors for periodontitis, such as obesity, cardiovascular diseases, emotional stress, genetic predisposition and adverse pregnancy outcomes. This study highlights the importance of awareness regarding periodontal health and its connection to systemic diseases among future dental specialists. Such knowledge would help them provide more informed treatment and participate in public efforts to prevent chronic diseases related to oral health. This study is a part of the project № 8276/27.11.2023 „Study of the awareness of periodontal and systemic health among students of Medical University - Sofia" which is financed by "Grant – 2024" of the Medical University of Sofia.

Keywords: awareness, periodontal disease, risk factors, dental students

Field: Medical Sciences and Health

1. INTRODUCTION

Deteriorating oral health represents a global public health problem with significant social, psychological and economic impacts on individuals, communities and healthcare systems. Poor oral health is characterized by the presence of dental caries, periodontal disease, or even total tooth loss. Recent analyses show that approximately 1.1 billion people worldwide are affected by severe periodontitis (Chen et al., 2021).

Periodontal diseases greatly contribute to poor oral health, yet public health approaches to their control and prevention have not received the level of attention directed towards dental caries. Periodontitis is a chronic disease that shares social determinants and risk factors with other systemic diseases, including cardiovascular diseases, diabetes and chronic respiratory diseases (Herrera et al., 2023). Smoking, obesity, poor diet and lack of physical activity are associated with an increased risk of periodontitis. In their review, Monsarrat et al. reported that periodontitis is linked to 57 systemic diseases and conditions in various studies, including cardiovascular and cerebrovascular diseases, rheumatoid arthritis, pregnancy-related complications, Alzheimer's disease, psycho-emotional stress, depression, anxiety and numerous others (Monsarrat et al., 2016).

The complex nature of periodontal diseases and their potential to influence systemic health underscore the need for a broad range of healthcare professionals, beyond dental practitioners, to be involved in public health programs to inform patients about the risk factors associated with periodontal diseases. Various studies indicate low awareness of periodontal diseases among both the general population and healthcare professionals. According to a study by Deinzer et al., a knowledge rate below 80% in their questionnaire was considered a knowledge deficit (Deinzer et al., 2009). A study by Sudhakar

et al. found that less than 60% of respondents (from various healthcare professions) correctly answered questions about the etiology, risk factors and treatment of periodontal diseases. Only 15% counsel and advise patients on the significance of oral hygiene for maintaining periodontal health, while 85% expressed a desire to improve their knowledge of personal daily oral hygiene tools and procedures (Sudhakar et al., 2019).

The aim of this study is to explore the awareness of periodontal diseases and their relationship with systemic diseases and conditions among students in the "Dental Medicine" program at the Medical University of Sofia.

2. MATERIALS AND METHODS

Research Object:
The study comprised 160 students from the Faculty of Dental Medicine in 4th and 5th course, including 94 women and 66 men, with an average age of 22.84 years. The students belonged to different courses in their study program which is favorable for the survey of their knowledge in the analyzed field.

An anonymous written survey was conducted using paper-based questionnaires, as well as online, ensuring participant anonymity. A standardized questionnaire was applied, comprising 22 questions and divided thematically into two sections:
• **Demographic Data**
• **Data regarding the knowledge about the Periodontal and Systemic Health and Significance of Risk Factors.**
This part included 22 questions regarding the causes, progression, and consequences of periodontal diseases and their associated systemic risk factors.

The questionnaire consisted solely of closed-ended questions with trichotomous responses ("Yes"/"No"/"Don't know"), allowing respondents to complete it quickly and facilitating easier statistical processing and analysis of the results with greater accuracy.

3. RESULTS AND DISCUSSION

Students in the "Dental Medicine" program demonstrated high levels of awareness regarding the etiology and nature of periodontal diseases, as well as the potential consequences if left untreated.

Figure 1. Distribution of participants by sex.
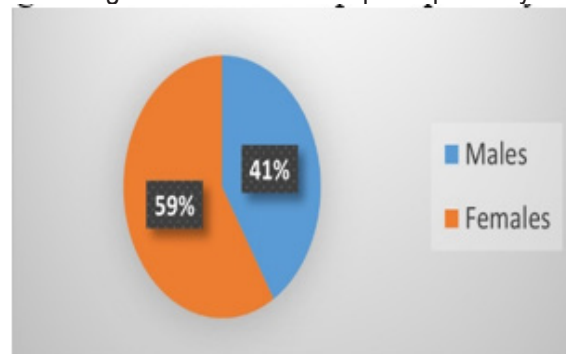
Source: Authors' research

A significant 90.6% of participants were aware that periodontal diseases are caused by microorganisms in the dental biofilm, and 96.9% believed that the main procedure in their non-surgical treatment - calculus removal - does not harm the teeth. Over 90% of respondents understood that periodontitis can lead to tooth loss, which could impair speech and articulation, thus negatively impacting the quality of life for affected patients. Furthermore, 83.7% of students correctly noted that gingivitis is not associated with bone loss.

A positive finding is that 97.5% of respondents considered bleeding gums to be a sign of gingival inflammation. This indicates that students recognize and can detect the earliest manifestation of periodontal diseases - gingival bleeding, positioning future clinicians to provide early treatment and prevention of periodontal diseases. By comparison, studies among practicing dentists showed awareness levels slightly above 80% regarding the clinical signs of periodontal diseases (Stojilković et al., 2023; Feroze et al.,
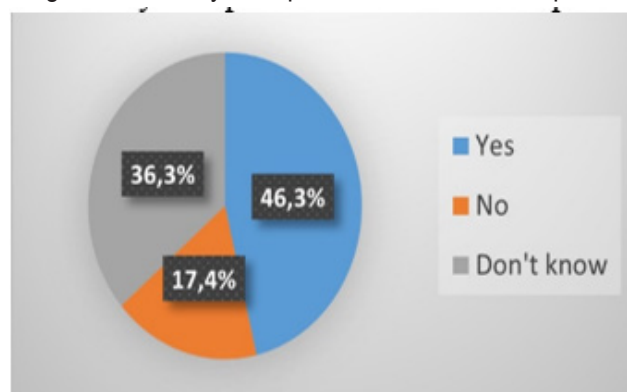
2022).

All participants acknowledged a link between oral and systemic health, though not all were aware of the mechanisms underlying this connection; 83.1% understood that periodontal disease could influence levels of systemic inflammation markers, such as cytokines.

Smoking and diabetes are well-established risk factors for periodontal diseases, modifying the diagnosis of periodontitis by determining its grade, which reflects the biological characteristics of the disease, its progression rate and the possibility of periodontal disease affecting systemic health (Tonetti et al., 2018). Our study found that 99.4% of respondents were informed about the role of smoking as a risk factor for periodontal diseases, while lower awareness was found concerning diabetes, with 80.6% recognizing the link between periodontitis and diabetes.

Obesity, another metabolic disease increasingly linked to more severe periodontal disease, is associated with higher levels of adipokines, leading to chronic low-grade inflammation, immune response dysregulation and the secretion of pro-inflammatory cytokines, resulting in more severe periodontal destruction (Abu-Shawish et al., 2022). Only 46.3% of students in our study correctly identified obesity as a potential risk factor for periodontitis, while 36.3% were uninformed, and 17.4% answered incorrectly. These findings suggest that more emphasis on metabolic diseases during dental education is needed, given their growing prevalence and social significance.

Figure 2. Obesity as a potential risk factor for periodontitis.

Source: Authors' research

Cardiovascular diseases, including hypertension, ischemic heart disease and stroke, are linked to periodontitis through increased systemic inflammation due to periodontitis, the presence of periodontal pathogens in the bloodstream, and their detection in atherosclerotic plaques (Herrera et al., 2023). Our study revealed knowledge gaps among students regarding the connection between cardiovascular and periodontal diseases, with 40% of them unaware of this relationship.

Figure 3. Cardiovascular diseases as a risk factor for periodontitis.
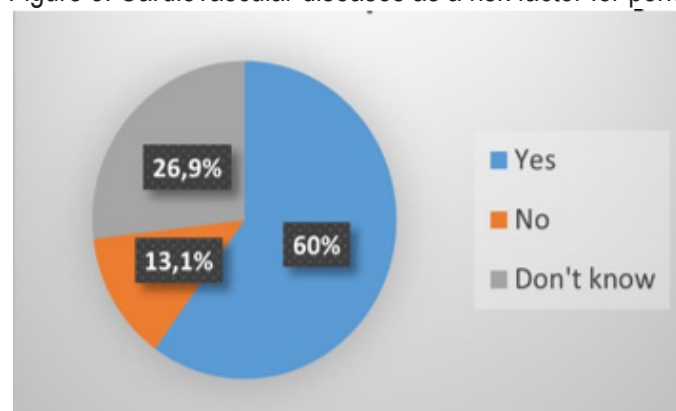
Source: Authors' research

Psycho-emotional stress is considered a risk factor for the development and progression of both periodontitis and other systemic diseases, including obesity, diabetes, hypertension and sleep disorders.

Chronic stress disrupts immune response, increasing susceptibility to the dysbiotic biofilm - the main etiological factor for periodontitis (Macri et al., 2024). This highlights the need for dental specialists to understand the influence of psycho-emotional stress on periodontal health and apply management strategies as part of comprehensive periodontal therapy. Unfortunately, our study found knowledge gaps among dental students, with over a quarter of them unaware of the connection between stress and periodontal diseases, while 71.2% answered correctly.

Figure 4. Emotional stress as a risk factor for periodontitis.
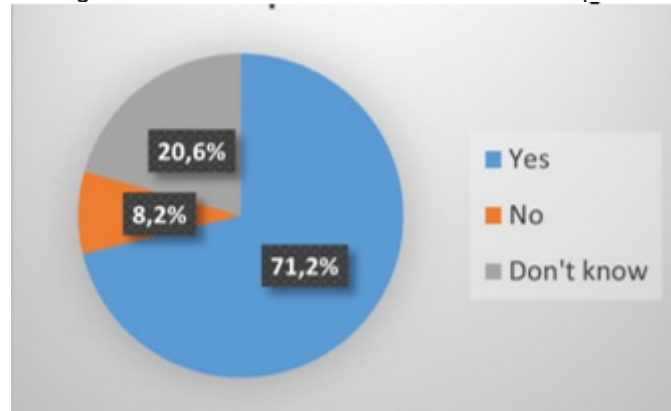
Source: Authors' research

A total of 72.5% of survey participants believed there is a genetic predisposition to periodontitis, while 10% did not consider genetic factors related to periodontal diseases, and 17.5% responded with "don't know." Increased awareness of genetic factors' role in periodontitis pathogenesis among dental students is essential. Recent years have highlighted that genetic factors are crucial in determining the risk of periodontal disease progression, as genetic testing may help assess individual susceptibility to periodontitis and the likelihood of tooth loss due to periodontal disease (Nibali et al., 2024).

Figure 5. Genetic predisposition to periodontitis.
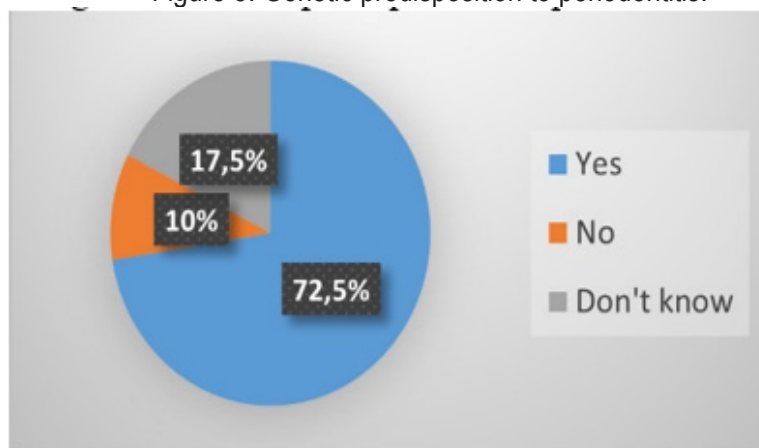
Source: Authors' research

The most significant knowledge gaps among dental students in this study were related to the association between periodontitis and adverse pregnancy outcomes. A total of 53.1% reported they were unaware of the link between periodontitis and preterm birth or low birth weight, while 8.7% gave incorrect answers, and only 38.2% were informed on this topic. These findings are unsurprising, as studies among practicing dentists and medical doctors showed awareness levels of 46% and 34%, respectively, regarding the link between periodontitis and preterm birth (Stojilković et al., 2023). In contrast, obstetricians and gynecologists demonstrated higher awareness, with 77.5% believing that periodontal disease could affect pregnancy outcomes (Turabi et al., 2022).

Figure 6. A link between periodontitis in pregnant women and preterm birth.
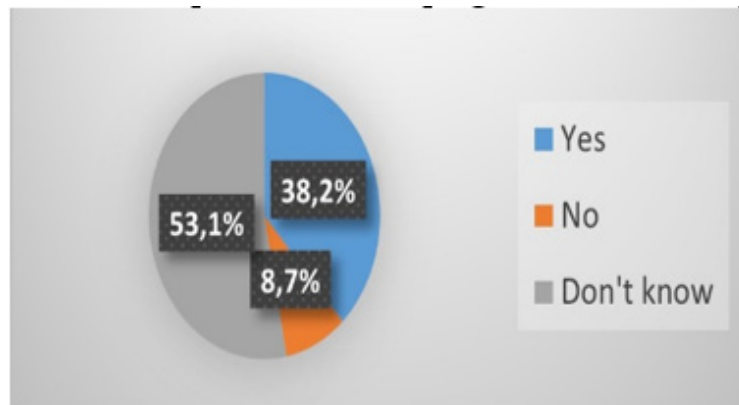
Source: Authors' research

4. CONCLUSION

This study highlights the importance of awareness of periodontal health and its connection to systemic diseases among future dental professionals. The findings reveal that, despite the students' solid overall knowledge of the etiology and treatment of periodontal diseases, significant gaps remain in their awareness of periodontal-systemic diseases interactions, such as the impact of metabolic diseases, stress, genetic factors and pregnancy complications.

These deficits suggest a need for more comprehensive education in periodontal and systemic health. Such knowledge would enable future dental professionals to provide more informed care and contribute to public efforts to prevent chronic diseases related to oral health. This study underscores the significance of incorporating more topics about the role of systemic risk factors for the periodontal diseases into curricula to improve the quality of healthcare and promote oral as well systemic public health.

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