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Original Article

Studying the Level of Knowledge of Medical Students about Oral Diseases and Their Relationship with General Health

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ABSTRACT

Considering the value of oral health as part of public health and the physician's role in community health, the current study was done to investigate the relationship between common dental and oral diseases and general health from the medical student's perspective. In this cross-sectional descriptive research, medical pre-internship and internship students were randomly selected and their level of awareness about common dental and oral diseases and their relationship with general health was examined using a questionnaire. The data were analyzed by SPSS version 23 statistical software. In this research, 191 medical students completed the research questionnaire, of which 52.8% (101 people) were female and 47.1% (90 people) were male. The mean (SD) age was 24.07 (1.92) and their mean (SD) grade point average at the time of the study was 15.95 (1.28). The mean (SD) score of their awareness of oral and dental diseases was 9.79 (3.27) with a 1 to 19 range. There was no statistically significant relationship between the average knowledge score by age, gender, academic semester, and GPA of the subjects ($P > 0.05$). The findings revealed that the average knowledge score of the subjects studied about common oral diseases and their relationship with general health was weak. Thus, it seems necessary to improve the knowledge level of medical students in this regard by adding the aforementioned topics to the educational curriculum of medical students.

Keywords: Oral diseases, General health, Medical students, Public health

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Introduction

The mouth is a mirror of the body's health and a window to the individual's overall health, and the two are interdependent and affect each other through biological, cognitive, emotional, and developmental factors [1-3]. Numerous oral diseases have significant adverse effects on overall health, and many systemic diseases show their initial manifestations in the oral cavity. These diseases include Behçet's syndrome, pemphigus vulgaris, erythema multiforme, tuberculosis, syphilis, celiac disease, lupus erythematosus, and Crohn's disease. Immunodeficiency diseases and hematological malignancies also cause specific lesions and symptoms in the mouth [4]. In contrast, diseases with high prevalence, such as dry mouth and recurrent oral ulcers [4, 5], are also less prevalent. However, if not diagnosed and treated promptly, they can have very bad consequences, such as leukoplakia and erythroplakia, which are painless, swelling, bleeding, and benign lesions that can transform into malignancy over time [5]. On the other hand, the similarity of oral lesions to each other and the difficulty of distinguishing them due to the specific conditions of the oral cavity increase the need for proper training of medical staff [4].

Since systemic health is related to oral health, a correct understanding by physicians of the mutual effects of systemic health and the patient's oral health status can be helpful in many ways [6, 7]. Experts have concluded that prevention should be used instead of treatment to improve oral health in society [8]. Therefore, healthy behavior and appropriate performance to preserve teeth and related structures are based on increased awareness and changing attitudes toward oral health [9].

Dental caries is especially prevalent in children. Most children are not examined by a dentist before the age of 3 years, while in primary care, children are regularly visited by doctors and specialists in child health clinics, about 10 times during the first year, which is an excellent opportunity to improve their oral health [10]. Therefore, oral health care and addressing risk factors require a multidisciplinary approach. In other words, oral health promotion needs to be included in the health care of doctors and nurses [11].

Various studies in the world have shown that a high proportion of doctors and paramedics do not have sufficient knowledge about the prevention of dental caries among children and the relationship between oral health and general health [12, 13]. The reason for this is the lack of oral health-related content in the educational programs of students in these fields [14, 15]. Given the need for physicians to be aware of oral diseases and since any change in the curriculum must be based on needs assessment studies, this study aimed to investigate the knowledge of medical students in the internship and pre-internship stages about common dental and oral diseases and their relationship to general health.

Materials and Methods

This descriptive-cross-sectional study was done on 210 students (out of 845 students) medical internship and pre-internship students (semesters 8 to 14) from the medical school who were randomly selected (using a random number table).

The data collection tool was a researcher-made questionnaire that includes two parts; the first part; demographic information of the individuals (age, gender, academic semester, and overall grade point average), and the second part consisted of 10 questions regarding the measurement of awareness of common oral and dental diseases and awareness of the relationship between oral and dental diseases and general health of the body. To examine its reliability, the questionnaire was first provided to 20 students of the target group as a pilot, its Cronbach's alpha was calculated and its reliability was confirmed with a criterion level of 0.79.

The questionnaires were provided to the students in person; initially, the aim of the study was explained to the students participating in the study, and to comply with the principles of ethics in research, participation in the study was voluntary. The questionnaires were anonymous and completed in person. The questionnaires were collected by the researcher and the data related to the main questions of the questionnaire were coded. The level of awareness in each question was scored from zero to two. Each question had 4 answer options: an incorrect answer was given a score of zero, the answer "I don't know" was given a score of one and the correct answer was given a score of two. The total score was considered as the individual's awareness score. Scores in the range of 17-20 were considered good awareness, in the range of 12-16.99 were considered moderate, and less than 12 were considered poor awareness.

The data were entered into the statistical software SPSS version 23 and analyzed using the T-test at a significance level of 0.05.

Results and Discussion

Of the 210 distributed questionnaires, 191 completed the research questionnaire. The percentage of student participation was 90%. Of these, 101 (52.8%) were female and 90 (47.1%) were male. The mean age was 24.07 ± 1.92 and the age range was 21-31 years. Their mean (SD) grade point average until the time of the study was 15.95 (1.28). Their mean (SD) score of awareness of oral and dental diseases was 9.79 (3.27) out of 20 scores with a range of 1 to 19. Accordingly, the mean score of awareness of the studied population was poor. Meanwhile, based on the predetermined division, the awareness scores of 81.2% of the students were poor, 16.8% were average, and 2.1% were good. **Table 1** shows the relative frequency of responses of the surveyed students regarding knowledge of common oral and dental diseases and their relationship with the general health of the body to each of the questions of the questionnaire.

Table 1. Frequency of students' responses to questions per question

Questions	Answers		
	Wrong	I don't know	Correct
Which oral lesion is most commonly seen during pregnancy due to hormonal changes and poor oral hygiene?	89 (46.6%)	78 (40.8%)	24 (12.6%)

Which of the following is not associated with periodontal disease (teeth-supporting tissues)?	36 (18.8%)	78 (40.8%)	77 (40.3%)
In general, what is the most common site of oral malignancy?	79 (40.4%)	52 (27.2%)	60 (31.4%)
What is the primary cause of dental caries?	69 (36.1%)	35 (18.3%)	87 (45.5%)
What is the most common cause of diffuse and acute oral ulcers in childhood?	72 (37.7%)	71 (37.2%)	48 (25.1%)
What is the most common oral malignancy?	60 (31.4%)	45 (23.6%)	86 (45%)
What is the main cause of dental plaque formation?	40 (20.9%)	43 (22.5%)	108 (56.5%)
In the mouths of people who have a habit of using smokeless tobacco such as NASS, which is not likely to be associated with NASS?	51 (26.7%)	80 (41.9%)	60 (31.4%)
If which oral lesion is observed, a complete evaluation of the patient for the possibility of AIDS is necessary?	102 (53.4%)	44 (23%)	45 (23.6%)
Which virus is currently strongly associated with oral cancer?	92 (48.2%)	40 (20.9%)	59 (30.9%)
Total average	69 (36.02%)	56.6 (29.62%)	65.4 (34.23%)

The most correct responses were related to knowledge of "the main cause of dental plaque formation" (56.5%) and knowledge of "the primary and main factor of dental caries" (45.5%). Regarding knowledge of "the side effects of smokeless tobacco use in the mouth" the most common response was "I don't know" (41%) and knowledge of "the relationship between periodontal diseases and systemic diseases" (40.8%). The most incorrect responses were related to knowledge of "possible oral lesions in AIDS" (53.4%) and knowledge of "the virus associated with oral cancer" (48.2%). In this study, the average knowledge score of boys was higher than that of girls, but the statistical difference between the two sexes was not significant (P = 0.062). The average knowledge score of the group over 25 years old was higher than that of those under 25 years old. However, the difference between the two age groups was not statistically significant (P = 0.956) **(Table 2)**.

Table 2. Comparison of the average knowledge score of the students surveyed by gender and age

Variable		Number (%)	Mean ± Standard deviation	P-value
Gender	Boy	90 (47.1 %)	9.32 ± 3.211	0.062
	Girl	101 (52.9%)	10.21 ± 3.296	
Age group	> 25 years	73 (38.2%)	9.81 ± 3.763	0.956
	< 25 years	118 (61.8%)	9.78 ± 2.956	

As can be seen in **Table 3**, the average knowledge score of the internship period was higher than that of the pre-internship period, but the difference between the two periods was not statistically significant (P = 0.291). Accordingly, the average knowledge score of the group with a GPA of more than 15 was higher than that of the group with a GPA of less than 15, but the difference between the two groups was not statistically significant (P = 0.382).

Table 3. Comparison of the average knowledge score of the students surveyed according to their academic level and GPA

Variable		Number (%)	Mean ± Standard deviation	P-value
Academic level	Pre-Internship	139 (72.7%)	9.63 ± 3.133	0.291
	Internship	52 (27.3%)	10.23 ± 3.633	
Grade	> 15	77 (40%)	10.47 ± 3.003	0.382
	< 15	19 (9%)	9.79 ± 2.974	

Oral diseases are one of the most important problems in public health. Therefore, maintaining oral health is essential for achieving public health, contributes significantly to individual, social, and economic development, and is a determining factor for the quality of life of individuals [16-18]. Since education is more effective in young people and access to students is simpler and easier, and the correct knowledge and attitude of students, especially medical students, in the field of oral health as well as oral cavity diseases can indirectly have a positive impact on the health and health of the community [19]. Therefore, medical students were selected as the target population in this study.

In this study, the average score of medical students' knowledge of common oral diseases and their

relationship with the general health of the body was 9.79 ± 3.27 out of 20 points, which is a poor level of knowledge. In the current study, the average knowledge score of students aged over 25 years was higher than that of students aged under 25 years, but the difference between these two groups was not statistically significant. The findings of the present study revealed that male students had a lower level of awareness than female students, but these differences were not statistically significant. As a result, the level of awareness of students about common dental and oral diseases and their relationship with general health was not dependent on gender, while in the study by Mian *et al*. [20], female dentists had better awareness and performance in the field of the relationship between systemic and oral diseases.

In the present study, the average knowledge score of individuals with higher GPAs was higher than that of individuals with lower GPAs, but this relationship was not significant. This means that the average knowledge score of individuals did not increase with increasing GPA. In addition, the results of the Al-Zarea study [21] showed that the amount of study did not have a statistically significant relationship with knowledge of the factors that cause periodontal disease, but it did have a significant relationship with knowledge of the symptoms of periodontal disease, preventive measures, relationship with general health, and systemic diseases. It seems that due to the lack of a systematic educational program in this regard, students answered the questionnaire questions based solely on general information or by chance, and therefore, an increase in awareness was not achieved with an increase in the academic semester.

The findings of the present study revealed that the average knowledge score in the internship was higher than the pre-internship level, but there was no statistically significant difference between the average knowledge score of students in different academic semesters. Thus, the level of awareness of individuals did not increase significantly with the increase in the academic semester, which is different from the findings of the study by Al-Zarea [21] and Yao *et al*. [2]. In a study by Nagarakanti *et al*. [22], which assessed the knowledge of physicians about the interrelationship between periodontal diseases and general health, the results showed that all physicians (100%) were aware of the relationship between oral health and general health. However, only 10% of the respondents referred their patients to a dentist without the patient's request. Very few respondents (23.3%) were knowledgeable about the different branches of dentistry [22]. In a study by Taşdemir and Alkan in Turkey, it was reported that 90.8% of the surveyed physicians were aware of the relationship between periodontal disease and systemic health. 56.5% of the participants had referred their patients to a periodontist for various reasons. 44% of the physicians cited gingival bleeding as the most common reason for referring patients to a periodontist. Although the vast majority of physicians reported that they knew that there was a relationship between systemic health and periodontal disease. However, the results of this study revealed that this awareness is not supported by accurate knowledge [23]. According to a study by Mian *et al*. [20], more than half of the physicians noticed oral and dental problems during the examination of patients. In a study by Sharrad *et al*. [24], more than half of the physicians were aware of the relationship between systemic and periodontal diseases.

In the current study, only 12% of the subjects were aware of the relationship between pregnancy and periodontal disease. However, in the study by Pralhad and Thomas [25], a positive and significant attitude was observed regarding the relationship between pregnancy and periodontal disease, while its relationship with gingival hypertrophy has been proven as a factor in preterm birth and low birth weight infants. In addition, Karunachandra *et al*. [26] and Vogt *et al*. [27] have pointed out in their studies the prevalence of periodontal diseases during pregnancy, especially with increasing fetal and maternal age.

In the current study, only 23% of the students surveyed were aware of the oral symptoms of AIDS. According to scientific sources, people with AIDS may experience a variety of problems in the head and neck areas, including the ears, nose, neck, and mouth. Among them, the highest prevalence (94%) is attributed to oral lesions [28]. Oral manifestations, including oral candidiasis and hairy leukoplakia, are very important in diagnosing and determining the progression and prognosis of HIV infection and AIDS and are also valuable in predicting treatment outcomes [29].

Oral cancer is one of the malignancies that can be detected early by clinical examination, provided that the examiner has sufficient knowledge and awareness to recognize these lesions [30]. In the present study, 45% of medical students recognized oral squamous cell carcinoma (SCC) as the most common oral cancer. In addition, 31.4% of the subjects considered the tongue and floor of the mouth as the most common sites of SCC and gave the correct answer. Overall, as mentioned, the average knowledge score of medical students in the present study was poor, which was similar to the results of Doshi *et al*.'s study [31] and studies conducted on physicians in the United States

[32] but was reported as moderate in Iraq [33] and good in India [34]. In the results obtained in the current study, no significant difference was reported in the increase in students' knowledge with the variables studied, including age, gender, educational level, and overall grade point average.

Conclusion

The current study was done to investigate the relationship between common dental and oral diseases and general health from the medical student's perspective. The mean (SD) age was 24.07 (1.92) and their mean (SD) grade point average at the time of the study was 15.95 (1.28). The mean (SD) score of their awareness of oral and dental diseases was 9.79 (3.27) with a 1 to 19 range. There was no statistically significant relationship between the average knowledge score by age, gender, academic semester, and GPA of the subjects. The findings revealed that the average knowledge score of the subjects studied about common oral diseases and their relationship with general health was weak. Thus, it seems necessary to improve the knowledge level of medical students in this regard by adding the aforementioned topics to the educational curriculum of medical students.

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