

Knowledge Study of the Oral Cavity and Systemic Diseases of Dentistry and Medical Students

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ABSTRACT

Background: Oral health is a healthy condition of hard and soft tissue and related components of the oral cavity, allowing each individual to eat, speak and interact socially. An unhealthy oral cavity can cause several diseases affecting general health and quality of life. Caries, periodontal disease, and xerostomia are oral cavity diseases that often occur. It can disrupt the normal flora, causing infection to suppress the immune system that can worsen other systemic diseases. Students' awareness of the importance of oral health aims to make an early diagnosis so that practitioners can carry out adequate treatment to prevent disease. **Objective:** The evaluation of knowledge about oral cavity and systemic diseases in dentistry and medicine students, University of North Sumatra, Indonesia **Materials and Methods:** The study was conducted with 140 dentists and medical students. This research used an analytic survey with a cross-sectional design using a questionnaire. Sampling using a simple random sampling method and analyzed by Chi-square test. **Results:** The level of knowledge of dental students with good knowledge was 94.29%, sufficient knowledge was 5.71%, and no knowledge was lacking. For medical students, 77.14% had good knowledge, 18.57% had adequate knowledge, and 4.29% lacked knowledge. **Conclusion:** The level of knowledge about oral cavity diseases with systemic diseases in college students is suitable, although some respondents have sufficient to insufficient knowledge.

Keywords: Knowledge level, Medical students, Oral cavity, and systemic diseases

ABSTRAK

Latar Belakang: Kesehatan gigi dan mulut adalah kondisi sehat jaringan keras dan jaringan lunak serta komponen-komponen terkait rongga mulut yang memungkinkan setiap individu untuk makan, berbicara dan berinteraksi sosial. Rongga mulut yang tidak sehat dapat menyebabkan beberapa penyakit yang dapat mempengaruhi kesehatan dan kualitas hidup secara umum. Penyakit rongga mulut yang sering terjadi adalah karies, penyakit periodontal, dan xerostomia yang dapat menyebabkan terganggunya flora normal, menyebabkan infeksi menekan sistem imun yang dapat memperburuk penyakit sistemik lainnya. Kesadaran mahasiswa akan pentingnya kesehatan gigi dan mulut bertujuan untuk melakukan diagnosis dini sehingga praktisi dapat melakukan pengobatan yang memadai yang dapat mencegah penyakit. **Tujuan penelitian:** Tujuan penelitian ini adalah untuk mengetahui tingkat pengetahuan tentang hubungan kondisi rongga mulut dengan penyakit sistemik **Bahan dan Metode:** Penelitian dilakukan dengan 140 mahasiswa kedokteran gigi dan kedokteran. Penelitian ini menggunakan survei analitik dengan desain cross sectional menggunakan kuesioner. Pengambilan sampel menggunakan metode simple random sampling dan dianalisis dengan uji Chi-Square. **Hasil:** Tingkat pengetahuan mahasiswa kedokteran gigi dengan pengetahuan baik sebesar 94,29%, pengetahuan cukup 5,71% dan tidak ada pengetahuan yang kurang. Untuk mahasiswa kedokteran, 77,14% memiliki pengetahuan baik, 18,57% memiliki pengetahuan cukup, dan 4,29% pengetahuan kurang. **Kesimpulan:** Tingkat pengetahuan tentang penyakit rongga mulut dengan penyakit sistemik pada mahasiswa berada pada kategori baik, meskipun sebagian responden memiliki pengetahuan cukup hingga kurang.

Kata Kunci : Tingkat Pengetahuan, Mahasiswa Kedokteran, Rongga Mulut dan Penyakit Sistemik

1. Introduction

Health is a healthy physical, spiritual, and social condition for everyone to live a productive life. Health is comprehensive and influences each other. For example, oral health affects overall body health because the mouth is the entry point for food and drink, producing energy for tissue maintenance and repair.¹ The condition of a healthy oral cavity will allow adequate nutritional intake into the body so that health is maintained. The World Health Organization (WHO) describes the relationship between the oral cavity and systemic conditions.² WHO also says that oral cavity diseases are a source of infection that can affect other organs in the body. The oral cavity contains various microorganisms, including viruses, fungi, protozoa, and bacteria.³ Bacteria can sometimes cause systemic conditions together with viruses, especially in immunocompromised individuals. These microorganisms can also cause focal infections.⁴

Focal infection is a local infection that usually occurs in the body for a long time, where bacteria can spread far to other places and risk aggravating systemic conditions. Focal infection is closely related to the teeth, affecting a person's systemic functions, such as the circulatory, skeletal, and nervous systems.⁵ The spread of microorganisms or toxins from infected teeth, tooth roots, or gums causes this. These microorganisms or toxins penetrate the bloodstream through lesions or damage caused by mechanical trauma. For example, in tooth extraction, the spread continues to the surrounding area and is systemic.⁵

Listyarifah (2018) examined the relationship between tooth extraction, odontectomy, scaling, endodontic treatment, and tonsillectomy to bacteremia. This is due to the lysis of the blood sample through aerobic and anaerobic incubation. The results showed that bacteremia occurred in 100% of patients after tooth extraction, 55% after odontectomy, 70% after tooth scaling, 20% after endodontic treatment, and 55% after tonsillectomy. This shows a relationship between focal infections that cause bacteremia, exacerbating other systemic diseases.⁶

Oral health relates to the maintenance of general health. Good knowledge of oral health is fundamental in the clinical practice of dentistry and medicine. The importance of increasing awareness of oral health among students aims to make an early diagnosis so that practitioners can carry out adequate treatment and can prevent disease.⁷ Dentists who are trained in this field can easily refer patients to specialists. This can reduce the morbidity and mortality rates of patients. In addition, many patients who have complaints in the oral cavity visit general practitioners first.⁷ However, general practitioners are often considered to serve patients less when compared to dentists. To refer patients to specialist dentists, general practitioners must know the treatment of diseases in the oral cavity.⁸

Research by Ameet (2013) reported about dental students' knowledge of the relationship between periodontal disease and systemic disease in Riyadh, Saudi Arabia. As much as 83% of respondents know about focal infection of systemic conditions. Regarding the relationship between periodontal disease and systemic diseases such as diabetes mellitus, there were 51.9% knew that there was a relationship between periodontal disease and diabetes mellitus.⁹

During pregnancy, 32% knew that there was a relationship between periodontal disease in pregnancy and heart disease, 17% knew that there was a relationship between periodontal disease and heart disease, and lung disease 10% knew there was a relationship between periodontal disease and heart disease. In research by Sartika IT regarding knowledge of the spread of infection and systemic manifestations of dental caries, medical students at the Islamic University of Bandung reported on 155 respondents who found that 68.4% of respondents had poor knowledge, 22.6% had moderate knowledge and 9% had poor knowledge.¹⁰

Dental and medical students learning together can improve health care and community collaboration—increased ability to provide high-quality health care and health promotion equity. Thus, interprofessional treatment requires dental and medical understanding. Clinical practice requires dentist-GP collaboration.¹¹ This study assessed dental and medical students at the Universitas Sumatra Utara in Medan, Indonesia, on the link between oral problems and systemic diseases.

2. Material and Methods

The researcher arranged for a research permit from the Faculty of Dentistry and the Faculty of Medicine, Universitas Sumatra Utara, Medan, Indonesia, to collect student data with active status and to get the WhatsApp number of the class leader.

2.1. Study Desain

The type of research used in this study was an analytic survey with a cross-sectional research design using a questionnaire. Analysis was carried out on the data obtained using the Chi-square test. The population in this study were dental students and medical students class of 2019, totaling 464 at the Universitas Sumatra Utara, Medan, Indonesia. The population of 2019 dental students is 224, and the 2019 medical student population is 240. The sampling technique in this study was simple random sampling, and the total sample size was 140 dental and medical students.

2.2. Data Collection

The researcher sent an online questionnaire in the form of a Google form link to the group leader via WhatsApp chat. Then it will be forwarded to every dental student and medical student class of 2019 at the University of North Sumatra. Samples were asked to read the explanation and informed consent page. If the sample agrees, then the sample can continue filling out the questionnaire, starting from the respondent's data and filling out the questionnaire. The results of completing the questionnaire will be entered and recorded in the researcher's Gmail account. Data processing and analysis were completed after all data collection procedures. Data analysis in this study used univariate analysis to describe the respondents' knowledge regarding the relationship between oral conditions and systemic diseases in dentistry and medical students at the Universitas Sumatra Utara, Medan, Indonesia.

2.3. Statistical Analyses

We then used bivariate analysis of the relationship between the independent and dependent variables to determine the respondents' knowledge regarding the relationship between oral conditions and systemic diseases in dentistry and medical students at the Universitas Sumatra Utara, Medan, Indonesia. The statistical test used is Chi-square.

3. Result and Discussion

Characteristics of Dentistry student respondents have 70 subjects (10: 14.29% male and 60: 85.71% female). Medical students totaled 70 (25 Male 33.71% and 45 Females 64.29%). Table 1 shows the knowledge of oral dan systemic diseases and their relation.

Table 1. Knowledge of systemic oral diseases by dentistry and medicine students, Universitas Sumatra Utara, Indonesia

No	Questions	Dentistry				Medical			
		Answer							
		Yes		No		Yes		No	
		n	%	n	%	n	%	n	%
1	Oral health is essential for one's life	70	100	0	0	70	100	0	0
2	Oral disease has no impact on quality of life	62	88,6	8	11,4	62	88,6	8	11,4
3	There is no relationship between oral health and systemic disease	66	94,3	4	5,71	65	92,9	5	7,14
4	Signs and symptoms of systemic disease manifestations in the oral cavity	70	100	0	0	60	85,7	10	14,3
5	Systemic disease that has manifestations in the oral cavity can increase the severity of systemic disease	66	94,3	4	5,71	69	98,6	1	1,43
6	Saliva can be used to diagnose oral and systemic diseases	65	92,9	5	7,15	68	97,1	2	2,86
7	Focal infection is not caused by infection of the teeth and oral cavity	53	75,7	17	24,3	59	84,3	11	15,7
8	Systemic disease can lead to periodontal disease	70	100	0	0	64	91,4	6	8,58
9	Periodontal disease is not a risk factor for systemic disease	56	80	14	20	56	80	14	20
10	There is a relationship between diabetes mellitus and periodontal	70	100	0	0	68	97,1	2	2,86

No	Questions	Dentistry				Medical			
		Answer							
		Yes		No		Yes		No	
		n	%	n	%	n	%	n	%
	disease								
11	Periodontitis is the 6th complication of diabetes mellitus	64	91,4	6	8,58	57	81,4	13	18,6
12	Periodontitis disease cannot increase blood glucose levels in diabetes mellitus	49	70	21	30	41	58,6	29	41,4
13	Periodontal disease can exacerbate lung disease	52	74,3	18	25,7	61	87,1	9	12,9
14	There is no association between oral cavity infections and respiratory diseases, such as chronic obstructive pulmonary disease and pneumonia	58	82,9	12	17,1	57	81,5	13	18,6
15	Bacteria from breathing can colonize the oral cavity so that it is possible to cause lung infections	60	85,7	10	14,3	69	98,6	1	1,43
16	Poor maintenance of oral health during pregnancy is not the cause of premature babies with low birth weight	46	65,7	24	34,3	44	62,9	26	37,1
17	Pregnant women are more likely to experience swollen and bleeding gums	69	98,6	1	1,43	58	82,9	12	17,2
18	In pregnant women not maintaining oral hygiene can cause thrush	5	7,15	65	92,9	4	5,72	66	94,3
19	Adanya hubungan antara penyakit periodontal dan penyakit jantung	65	92,9	5	7,15	54	77,1	16	22,9
20	Periodontal sufferers can cause atherosclerosis thereby increasing the risk of coronary heart disease	64	91,4	6	8,58	49	70	21	30
21	Taking antihypertensive drugs can cause swelling of the gums	65	92,9	5	7,15	49	70	21	30
22	Periodontal disease is not associated with stroke	40	57,1	30	42,9	45	64,3	25	35,7
23	Periodontal disease is associated with rheumatoid arthritis	52	74,3	18	25,7	47	67,1	23	32,9
24	There is a relationship between osteoporosis and bone loss in the jaw	68	97,1	2	2,86	60	85,7	10	14,3
25	In pregnant women, not maintaining oral hygiene can cause thrush	5	7,15	65	92,9	4	5,72	66	94,3
26	There is a relationship between periodontal disease and heart disease	65	92,9	5	7,15	54	77,1	16	22,9
27	Periodontal sufferers can cause atherosclerosis, thereby increasing the risk of coronary heart disease	64	91,4	6	8,58	49	70	21	30
28	Taking antihypertensive drugs can cause swelling of the gums	65	92,9	5	7,15	49	70	21	30
29	Periodontal disease is not associated with stroke	40	57,1	30	42,9	45	64,3	25	35,7
30	Periodontal disease is associated with rheumatoid arthritis	52	74,3	18	25,7	47	67,1	23	32,9
31	There is a relationship between osteoporosis and bone loss in the jaw	68	97,1	2	2,86	60	85,7	10	14,3
32	Osteoporosis is not the cause of tooth loss	54	77,2	16	22,9	49	70	21	30

The results of the percentage knowledge of the relationship between the condition of the oral cavity with systemic diseases in dental students can be seen in Table 2. Of those with a good level of knowledge, 66 respondents (94.29%), those with sufficient knowledge are four (5.71%), and those who are less knowledgeable are not. Meanwhile, for medical students who had a good level of expertise, 54 respondents (77.14%), those with sufficient knowledge, 13 respondents (18.57%), and those with less knowledge were three respondents (4.29%).

Table 2. Percentage of knowledge regarding the relationship between the oral cavity and systemic diseases by dentistry and medicine students, Universitas Sumatra Utara, Indonesia

Knowledge Levels	n	Good		Enough		Not enough	
		n	%	n	%	n	%
Dentistry Students	70	6,6	94,29	4	5,71	0	0
Medical Students	70	54	77,14	13	18,57	3	4,29

The results showed that the level of knowledge of dental students who had good knowledge was 94.29%, had sufficient knowledge of 5.71%, and those did not know dentistry students (Table 2). The results of this study were almost the same as those of Rahtyanti et al., who examined new dentistry students with a high level of dental and oral health knowledge. The results showed that new dentistry students had a good knowledge level of 89.1%, those with sufficient knowledge level were 10.9%, and there were no students with a poor level of knowledge.¹² The results of this study were almost the same as Sharda (2008), which shows that the level of sound learning is 72%

regarding the relationship between oral and systemic conditions in dental students at King Faisal University, Saudi Arabia.¹³

The results showed that the level of knowledge of medical students who had good knowledge was 77.14%, had sufficient knowledge was 18.57%, and had less knowledge was 4.29% (Table 2). The results of this study are in line with the research of Bokhari SAH et al., which shows that the level of good knowledge is 64% regarding the relationship between oral and systemic conditions in medical students at King Faisal University, Saudi Arabia. 12 The results of this study are almost in line with those of Mian FI et al., who studied medical practitioners' knowledge regarding the relationship of oral health to systemic diseases at the Medical University, Faisalabad, Pakistan. The results showed a good level of knowledge of 40%, a sufficient level of knowledge of 25.8%, and an insufficient level of knowledge of 34.4%.¹⁴

Education is very closely related to knowledge, especially health knowledge. Someone who has a higher education is assumed to have a good understanding. The higher a person's formal education, the better the knowledge and attitudes about health that influence healthy life behavior, thus, the easier it is to get a job and the more income one gets to meet health needs.¹⁵ Higher education can shape individuals' attitudes and perspectives toward health. Through formal education, individuals are exposed to the importance of maintaining good health, preventive measures, and the impact of lifestyle choices on overall well-being. This knowledge and awareness acquired through education can influence individuals' health behaviors and decision-making processes.¹⁶

Moreover, higher education can open up more job opportunities, potentially leading to higher income. People with higher education qualifications often have access to a wider range of employment options and are more likely to secure jobs that provide better financial stability.¹⁷ This increased income can contribute to meeting health needs, such as accessing quality healthcare services, affording nutritious food, and engaging in a healthy lifestyle. However, it is important to note that education alone does not guarantee good health or healthy life behavior.¹⁸ While education provides knowledge and creates awareness, individuals must also actively apply it and make informed choices to maintain their health. Factors such as socio-economic status, access to healthcare facilities, and personal circumstances also play a role in determining health outcomes.¹⁹

Higher education can significantly influence knowledge and attitudes about health, which, in turn, may impact healthy life behavior. Combining education, knowledge, and positive health attitudes can enhance job prospects, increase income, and facilitate fulfilling health-related needs. However, it is essential to recognize that various factors contribute to overall health, and education is just one component of a comprehensive approach to well-being.²⁰

4. Conclusion

Dentistry and medical students' knowledge regarding the relationship between oral conditions and systemic diseases is considered to be in a suitable category. However, there may be some respondents who have less ability. It is hoped that students will be able to increase their knowledge of the relationship between oral conditions and systemic diseases to facilitate early diagnosis and provide adequate treatment plans.

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Authors Contribution

Contribution	Siregar D	Marbun AH	Refwita NN	Khairima N	Jannah MK
Concepts or ideas	√	√	√	√	√
Design	√	√	√	√	√
Definition of intellectual content	√				
Literature search		√	√	√	√
Experimental studies	√				
Data acquisition		√		√	√
Data analysis	√	√		√	√
Statistical analysis	√		√	√	√
Manuscript preparation	√		√	√	√
Manuscript editing	√	√			√
Manuscript review	√	√			√



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