Overview of knowledge level clinical students of Faculty of Dentistry Hasanuddin University regarding burning mouth syndrome

Tinjauan tingkat pengetahuan mahasiswa kedokteran gigi Fakultas Kedokteran Gigi Universitas Hasanuddin mengenai sindrom mulut terbakar

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ABSTRACT
Burning mouth syndrome (BMS), or glossopyrosis, is a condition characterised by a burning sensation or pain in certain areas of the oral cavity, particularly the tongue, without any changes to the surface of the oral tissue. Some data indicate that BMS sufferers are not being treated properly, highlighting the importance of clinical education about BMS for practitioners. This study explores the level of knowledge of professional students about BMS. This descriptive analytical cross-sectional study used a questionnaire to collect data, with 74.2% of respondents demonstrating good knowledge of BMS and showing motivation to learn after completing the Clinical Readiness Programme. It was concluded that professional students have a good level of knowledge about BMS, but further research is needed, especially among undergraduate dental students, to increase awareness and knowledge about BMS.
Keywords: burning mouth syndrome, knowledge level, clinical students

ABSTRAK
Burning mouth syndrome (BMS), atau *glossopyrosis*, adalah kondisi sensasi rasa terbakar atau nyeri pada beberapa daerah di rongga mulut, khususnya lidah, tanpa perubahan pada permukaan jaringan mulut. Data menunjukkan penderita BMS tidak ditangani dengan baik sehingga perlu ditekankan pentingnya upaya pendidikan untuk edukasi klinis tentang BMS kepada praktisi. Penelitian ini mengeksplorasi gambaran tingkat pengetahuan mahasiswa profesi terkait BMS. Penelitian deskriptif analitik desain *cross sectional* menggunakan kuesioner untuk mengumpulkan data yaitu 74,2% responden menunjukkan pengetahuan yang baik tentang BMS menunjukkan motivasi belajar setelah menyelesaikan *Clinical Readiness Program*. Disimpulkan bahwa mahasiswa profesi memiliki tingkat pengetahuan tentang BMS dengan baik namun penelitian lebih lanjut diperlukan terutama pada mahasiswa FKG tingkat dasar untuk meningkatkan kesadaran dan pengetahuan tentang BMS.
Kata kunci: *burning mouth syndrome*, tingkat pengetahuan, mahasiswa profesi
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INTRODUCTION

According to Notoadmojo, knowledge is the result of *knowing* and occurs after individuals have sensed a particular object through their sensory organs, which include sight, hearing, smell, taste, and touch. Most human knowledge is acquired through vision and hearing that is influenced by education, which plays a significant role in its expansion. Higher levels of education are expected to lead to a broader understanding, though individuals with lower educational levels are not necessarily devoid of knowledge. Knowledge about a particular object can encompass both positive and negative aspects, which ultimately influence one's attitude toward the object. The more positive aspects one knows, the more likely they are to develop a positive attitude toward it.[1]

Burning mouth syndrome (BMS), also known as glossopyrosis, conditions characterized by a burning or painful sensation in the mouth, particularly on the tongue, without any observable changes in the mucosal surfaces.[2] It is often associated with anxiety or depression without clinical manifestations, although the tongue may appear slightly reddened in some cases. Patients typically complain of a burning sensation.[3] According to the International Association of Pain and Headache Society, BMS also is a distinct nosological entity that includes all forms of BMS, such as stinging or pain, in patients with clinically normal oral mucosa, and without any local or systemic diseases.[4]

Patients suffering BMS often delay in diagnosis and treatment, even after seeking medical help. Some patients undergo unnecessary tests, leading to misdiagnosis or sometimes no diagnosis at all.[5] Even those diagnosed with BMS correctly frequently receive inappropriate or ineffective treatments. This underscores the importance of raising awareness among healthcare providers about BMS. Diagnosis and management of BMS present a challenge to dental professionals due to its varied and multifactorial etiology.[6]

Several studies indicate that the prevalence of BMS is higher among women. A study in Sweden found that 4% of individuals experienced a burning sensation in the mouth with no clinical abnormalities. Among men, the prevalence was 4%, with an average age of 59 years, while among women, it was 6%, with an average age of 57 years. The highest prevalence, 12%, was observed in women aged 60-69 years. The reported prevalence in the general population was 1-15%, depending on the etiological factors influencing the condition.[7]

Dentists, as part of the healthcare profession, must undergo rigorous education to become qualified. According to the Indonesian Medical Education Law No. 20 of 2013, dental professionals must pass a national competency test before receiving their professional certification. The clinical internship, known as *koas* in Indonesian, follows the completion of an undergraduate dental program and serves as the final stage of education. This stage includes practical training in promoting, preventing, curative, and rehabilitative dental care, typically conducted

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in dental hospitals and clinics under the guidance of qualified instructors. This training aims to equip dental students with the necessary knowledge, skills, and professional. Judgment to effectively diagnose and treat patients, including those with conditions like BMS.[8] Therefore, understanding BMS is a critical aspect of training fordental professionals. The objective of this study is to assess the knowledge level of dental profession students at the Faculty of Dentistry Hasanuddin University regarding BMS.

METHODS

This study employed a descriptive research design with an analytical observational method, utilizing a single variable to describe a phenomenon at a specific point in time within a population or sample. The research aimed to assess the knowledge of dental profession students at Hasanuddin University regarding BMS. This study used a cross-sectional design to collect data at a specific moment.

The research conducted at the Hasanuddin University Dental and Oral Hospital in Makassar, South Sulawesi, from May to July 2024. The population consists of dental profession students at Hasanuddin University who are enrolled in the Oral Medicine cluster. A total sampling technique was applied, with a homogeneous sample selected based on predefined inclusion criteria.

Inclusion criteria for the sample were dental profession students who have recently entered the Oral Medicine cluster between May and July 2024 and who were willing to complete a questionnaire about their knowledge of BMS. Exclusion criteria included students who were in a re-cluster status in the Oral Medicine Department and those who did not complete the entire questionnaire.

Data were collected through a knowledge questionnaire on BMS, which was distributed via Google Forms. The primary data directly obtained from the respondents. The instruments for data collection included the Google Forms-based questionnaire and tools to analyze, such as a laptop with Excel and SPSS software.

The procedure involved the dental profession students filling out the questionnaire before starting their Oral Medicine rotation. Afterward, the responses were analyzed using Microsoft Excel for statistical analysis.

RESULTS

The study involved distributing a questionnaire to 35 respondents who met the inclusion and exclusion criteria. The respondents were dental profession students batch 2020 who had passed the first stage of the Clinical Readiness Program. Based on the collected data, the characteristics of the respondents and the distribution of their knowledge level are presented on tabel 1 to 11.

Table 1 Distribution of respondents by gender

Gender	n	%
Male	5	14.2%
Female	30	85.8%
Total	35	100%

Table 2 Distribution of respondent answers on common symptoms of BMS

Question	Answer	n	%
What are the common symptoms of BMS	Burning sensation	34	97.1%
	Xerostomia	1	2.9%
	Taste change	0	0%
Total		35	100%

Table 3 Distribution of respondents' answers on the prevalence of BMS by age

Question	Answer	n	%
At what age is BMS more common?	20-30 years	2	5.7%
	30-40 years	2	5.7%
	≥45 years	31	88.6%
Total		35	100%

Table 4 Distribution of respondent answers on the prevalence of BMS by gender

Question	Answer	n	%
Is BMS common in women?	Yes	1	2.9%
	No	3	8.6%
	Unsure	31	88.5%
Total		35	100%

Table 5 Distribution of respondent answers on the area affected by BMS

Question	Answer	n	%
What is most commonly area affected by BMS?	Tongue	30	85.7%
	Palate	4	11.4%
	Gingiva	1	2.9%
Total		35	100%

Table 6 Distribution of respondent answers on the causes of BMS

Question	Answer	n	%
What do you think causes BMS?	Neuropathology	16	45.7%
	Idiopathic factors	12	34.3%
	Systemic factors	7	20%
Total		35	100%

Table 7 Distribution of respondent answers on available BMS tests

Question	Answer	N	%
What test are available for BMS?	Salivary flow	21	60%
	Oral swab	3	8.6%
	Blood test	11	31.4%
Total		35	100%

Table 8 Distribution of respondents answers on medications that cause BMS

Question	Answer	n	%
Which medications may cause BMS?	ACE Inhibitors	28	80%
	Diazepam anti epilectic drugs	7	20%
Total		35	100%

Table 9 Distribution of respondent answers on available treatments for BMS

Questions	Answer	n	%
Are you aware of treatments available for BMS?	Yes	25	71.4%
	No	4	11.4%
	Unsure	6	17.1%
Total		35	100%

Table 10 Distribution of respondents answers on non-pharmacological treatments for BMS

Question	Answer	n	%
What non pharmacological treatments are available for BMS?	Cognitive therapy	31	88.6%
	Smoking cessation	2	5.7%
	Acupuncture	2	5.7%
Total		35	100%

Table 11 Respondent knowledge level on BMS

Knowlegde Level	Frequency (n)	%
Good	26	74.2%
Average	8	22.8%
Poor	1	2.8%
Total	35	100%

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DISCUSSION

The BMS is a painful condition often described as a burning, hot, or tingling sensation in the mouth, which can occur daily for months or even longer. Dry mouth and changes intaste are common accompanying symptoms. Despite being a common complaint, the exact cause of BMS is often undetermined. It occurs more frequently in women, particularly those between the ages of 40 and 80. Other terms used for BMS include glossodynia, glossopyrosis, stomatodynia, stomatopyrosis, sore tongue, and oral dysaesthesia. According to Torgerson in a study of *diagnosis and treatment of oral mucosal lesion*, the diagnosis of BMS is characterized by a burning sensasation in the mouth, with or without dysgeusia and xerostomia, often diagnosed through patient history.

Data from this study indicated that burning sensation is the most commonly reported symptom in patients with BMS, with discomfort also noted during the consumption of spicy or acidic foods.[9] The discomfort varies in intensity, depending on the lesion and the timing of its occurrence.

Severe discomfort is often described as a burning sensation on the oral mucosa and the anterior tongue.[10] The pain, including the burning sensation, can be triggered by eating spicy food, which activates sensory nerve fibers through ion channels, such as the vanilloid receptor subtype 1 (VR1), which opens when capsaicin binds. This results in calcium and sodium ions entering the nerve fibers, depolarizing them and transmitting the pain signal to the brain. This mechanism also explains why the mouth feels hot or burned.[10] Other common symptoms include tingling or numbness on the tongue, dry mouth, and taste alterations such as a bitter or metallic taste. Some individuals may also experience difficulty swallowing or a sore throat. Despite these symptoms, physical examinations often show normal oral mucosa without clear abnormalities.[11]

Prevalence studies revealed that BMS is more common in older adults, particularly those over the age of 45, with most cases occurring 65-74 years. The condition is also more prevalent in women, especially post-menopausal women, with a prevalence rate ranging 18-33%.[9] Studies show that women in their 60s and 70s have the highest rates of BMS, with up to 12% of women aged 60-69 reporting symptoms. Although BMS can occur in men, the prevalence is significantly higher in women, with factors such as stress, anxiety, and depression often exacerbating the condition.[12]

Regarding the areas most affected, tongue is the most commonly involved site, with 50-70% of BMS patients reporting a burning sensation in this area. Other areas like the inside of the lips, the roof of the mouth, and the buccal mucosa are also frequently affected. Systemic factors play a significant role in the onset of BMS.[13] Local and systemic conditions such as dry mouth (xerostomia), fungal infections like oral candidiasis, food allergies, and nutritional deficiencies (e.g. vitamin B12, iron, and zinc) can contribute to the development of BMS. Endocrine disorders, such as diabetes and hypothyroidism, may also be implicated in triggering the symptoms. In some cases, BMS is considered a psychosomatic issue, where psychological stress or emotional disturbances may trigger the condition. The deregulation of pain inhibition pathways in the brain is thought to be involved in the pathogenesis of BMS, particularly in individuals with anxiety or depression.[14]

Saliva tests can provide valuable insights into the pathogenesis of BMS. Studies have shown significant alterations in the composition of saliva in BMS patients, such as increased levels of sodium,total protein, lysozyme, amylase, and immunoglobulin. These changes may contribute to symptoms like dry mouth (xerostomia) and may be an important factor in the disease process.[15] Blood tests can also help identify secondary causes, such as systemic diseases or hormonal imbalances.[16]

Medications, particularly angiotensin-converting enzyme (ACE) inhibitors, have been linked to the development of BMS. Some studies have reported that BMS symptoms can occur as a side effect of ACE inhibitors, with symptoms resolving once the medication is discontinued.[17] Other drugs, such as diazepam and certain antiepileptics like carbamazepine and valproic acid, may also contribute to BMS in some cases. While not directly causing BMS, these drugs may affect pain perception or contribute to the symptoms through sedative effects.[18]

Non-pharmacological treatments for BMS include cognitive behavioral therapy (CBT), which has shown promising results in managing the psychological aspects of BMS, such as anxiety and stress. This therapy can significantly alleviate symptoms and improve patients' quality of life.[19] Smoking is known to exacerbate BMS by irritating the oral mucosa, contributing to dry mouth, and heightening psychological stress, all of which worsen the condition.[14] Acupuncture is also considered a promising treatment, providing relief through nerve stimulation, although it is often combined with other therapeutic approaches for optimal results.[20]

It is concluded that most respondents had a good understanding of BMS, likely due to their involvement in oral disease courses and previous academic assessments. 74.2% respondents had good knowledge, 22.8% had moderate knowledge, and only 2.8% had limited knowledge about BMS. This reflects a positive trend in the awareness and understanding of the condition among individuals exposed to medical education. Most students possess a solid understanding of BMS. Further research is needed mainly among students in earlier stages of education to improve awareness and knowledge of BMS.

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