



# A Cross-Sectional Study on Epidemiological Trends and Determinants Influencing Self-Monitoring of Oral Mucosal Conditions at Kerman Dental School, Iran (2021-2022)

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## Abstract

**Background:** Oral self-examination refers to looking for symptoms of disease in the mouth. Studies carried out so far in the field of Mouth Self-examination (MSE) have mentioned this technique as a way to screen for precancerous and cancerous lesions. The current study was aimed at examining the patterns of MSE of the oral mucosa in patients referred to the oral medicine department.

**Methods:** This cross-sectional study was conducted on 165 patients. The questionnaire employed in this study included 21 items related to demographic characteristics and MSE patterns, and was finally analyzed by chi-square and Fisher's exact tests after confirming the validity and reliability of the questionnaires, as well as the data obtained from completing the questionnaires.

**Results:** The majority of respondents were female (60.6%), and 97.5% of them had at some point performed MSE. In 75.2% of cases, MSE was performed through observation in the mirror, with 91.9% of patients noticing changes in their mouths. After discovering changes in their mouths, 87.6% of them experienced anxiety, and 59.6% thought of the possibility of cancer in the mouth. It should be noted that only in 13% of the examined patients did the final diagnosis confirm the presence of a malignancy. There was a significant relationship between the respondents' personal perception of their depression or anxiety and thinking about the possibility of mouth cancer ( $P < 0.05$ ).

**Conclusion:** The present research may be considered a preliminary study, the results of which introduce intermittent and frequent MSE as a possible factor for the occurrence or exacerbation of anxiety and cancerphobia in patients for the first time, and its confirmation necessitates further studies. Furthermore, since the patients of this community perform MSE at a higher-than-expected percentage, future studies are recommended to investigate the participants' psychological profiles.

**Keywords:** Mouth, Pathophobia, Self-examination, Surveys and questionnaires

**Citation:** Alaei A, Navabi N, Chamani G, Afshari Z, Estabraghi E, Sharifzadeh SS. A cross-sectional study on epidemiological trends and determinants influencing self-monitoring of oral mucosal conditions at Kerman dental school, Iran (2021-2022). *J Oral Health Oral Epidemiol.* 2026;15:2504.1730. doi:10.34172/johoe.2504.1730

**Received:** April 19, 2025, **Revised:** October 30, 2025, **Accepted:** December 30, 2025, **ePublished:** February 10, 2026

## Introduction

Self-examination is a cornerstone of preventive medicine, defined as the process by which an individual inspects their own body for signs of disease. This approach has been successfully integrated into public health strategies for the early detection of conditions such as melanoma, testicular cancer, and breast cancer, where visible or palpable changes can be identified by the patient.<sup>1-4</sup> The primary benefit lies in facilitating early diagnosis, which, through prompt specialist referral and timely intervention, significantly improves prognosis and reduces morbidity and mortality. Within dentistry, the concept of mouth self-examination (MSE) has been proposed as an analogous

screening tool for oral potentially malignant disorders and oral cancer.<sup>5-8</sup> The majority of research supporting MSE, however, originates from high-prevalence regions such as India. In these contexts, the high consumption of smokeless tobacco and the immense population burden make MSE a pragmatic, complementary public health strategy to alleviate pressure on overstretched healthcare systems.<sup>8-9</sup>

This established perspective, however, may not be universally applicable. In clinical practice, particularly in oral medicine clinics, a different challenge emerges. We frequently encounter patients who perform meticulous, daily self-examinations. Lacking familiarity with the



wide range of normal oral anatomical variations, these individuals often misinterpret harmless structures as pathological, leading to significant, unwarranted anxiety.<sup>10</sup> For patients with underlying conditions such as cancer phobia or somatoform disorders, this behavior can become a debilitating obsession, leading them to seek repeated consultations from multiple healthcare providers, convinced of a serious, undiagnosed illness. Managing these patients and reassuring them of a benign diagnosis presents a considerable challenge for specialists.<sup>10,11</sup>

Consequently, the role of MSE remains a subject of debate among experts, and it is not universally endorsed as an effective screening method for all patient populations.<sup>9,11,12</sup> The uncritical promotion of MSE, without considering the psychological profile of the individual or the epidemiological context, may be insufficient and potentially harmful. This dichotomy reveals a critical gap in the literature: While studies have focused on MSE as a tool for cancer detection in high-risk populations,<sup>12-16</sup> there is a paucity of research investigating MSE as a behavior itself, particularly in populations with a lower baseline risk of oral cancer, such as in Iran.

Therefore, it is imperative to re-evaluate the concept of oral self-examination. A more nuanced understanding is needed, one that moves beyond a one-size-fits-all screening recommendation and explores the epidemiology of the behavior itself. Thus, the present study was conducted to investigate the prevalence, patterns, and underlying determinants of oral mucosal self-examination among patients attending the specialized oral medicine department at Kerman Dental School, Iran. The findings aim to provide an evidence base to better guide patient education and develop more effective, individualized management strategies for this unique clinical challenge.

## Methods

This cross-sectional study was conducted on patients referring to the specialized oral medicine department of the School of Dentistry in Kerman. Data collection in this study was performed through face-to-face interviews to complete the questionnaire during a scheduled appointment. Inclusion and exclusion criteria were as follows:

1. Inclusion criteria: The study included patients aged 16 years or older who were referred to the specialized oral medicine department, had a final diagnosis of an oral mucosal lesion, and were available for a scheduled face-to-face interview to complete the questionnaire.
2. Exclusion criteria: Patients whose final diagnosis did not include oral mucosal lesions (e.g., patients with orofacial pains, various types of headaches, and temporomandibular joint disorders), and cases where the final diagnosis was not clearly determined

in their medical files.

The questionnaire was given to the participants by a final-year dental student, and their responses were recorded on the relevant forms. The researcher developed the questionnaire used in this study, which consisted of 21 items. The initial four items included demographic information (age, gender, education level, and occupation). In the second section, through 7 questions, information about the patients' problem characteristics, presence of anxiety and depression, history of cancerous lesions in the patients or their relatives, and self-examination was collected. The third section, consisting of 9 questions, pertained to the patterns of self-examination, and these 9 questions assessed the characteristics of self-examination. The last item of the questionnaire was dedicated to recording the final diagnosis assigned to the patients based on the available information in their files.

The content validity of the questionnaire was assessed by providing it to 10 experts, who were asked to provide their opinions on the appropriateness or inappropriateness of the questionnaire items, which were taken into account in revising the questionnaire. The reliability of the questionnaire was examined by completing it for 20 cases of the participants, and by determining Cronbach's alpha coefficient; an acceptable coefficient of 0.7 was obtained.

The data obtained from the completed questionnaires were entered into version 26 of the SPSS software. Descriptive statistics (percentage, mean, and standard deviation) were used to describe the data. The significant association between individual factors related to self-examination and patterns of self-examination in the participants was examined using chi-square and Fisher's exact tests, and a significance level of 0.05 was considered for this purpose.

The sample size was calculated as 150 individuals based on a similar previous study and considering power = 80% and alpha = 0.05<sup>17</sup>. The completion of the questionnaires in the present study was based on the patients' oral consent, and their personal information was kept confidential until the end of the research. The present study received ethical approval from the Research and Technology Deputy of Kerman University of Medical Sciences with the approval number IR.KMU.REC.1400.235.

## Results

In the present study, a total of 165 participants took part, of whom 97.5% performed self-examination of the oral cavity. The mean age of the participants was  $47.73 \pm 16.31$  years (ranging from 16 to 88 years). Out of the participants, 60.6% were female, and the rest were male. The educational level of the majority of participants (35.1%) was diploma or higher (Table 1).

It should be noted that due to 40 participants (24.2%) not providing an answer to the "occupation" question, this demographic data point was excluded. For the majority of

**Table 1.** Demographic Data of the Participants in the Study

Demographic Data		Frequency (Percentage)
Gender	Female	100 (60/6)
	Male	65 (39/4)
Education Level	Illiterate	16 (9/6)
	Below Diploma	51 (30/9)
	Diploma And Higher Diploma	58 (35/1)
	Bachelors And Masters	37 (22/4)
	Doctorate	3 (1/8)
Total		165 (100)

respondents, more than one month had passed since the onset of their oral problem. Most of the mentioned cases were identified for the first time due to the occurrence of symptoms, and self-examination was only the first method of detecting the problem in 6.6% of the cases. The majority of participants believed themselves to be individuals with high anxiety and stress (Table 2).

The majority of participants performed self-examination of the oral cavity through mirror observation, and most of them noticed the presence of changes in their mouths after performing such self-examination, with the prevalent changes being perceived by the patients as the presence of “oral ulcers”. The frequency of rechecking the mouth by the patients was usually several times per week. Most of the individuals surveyed sought assistance from others to perform self-examination, and the majority of them, by continuing the process of self-examination, noticed the occurrence of changes in the intended lesion, which led to the development of anxiety in most of these individuals. Most patients in this study had thought about the possibility of having oral cancer, and half of them, following this thought, experienced “very high” levels of stress (Table 3).

The majority of the problems that led patients to seek medical attention were categorized as white lesions of the oral mucosa, and the second most common category was oral ulcers (Table 4). A significant association was found between the participant’s responses to the question “Do you consider yourself an anxious and stressed person?” and two questions: “Do you experience anxiety due to the changes you observe after self-examination?” and “Have you thought about the possibility of having oral cancer?” ( $P=0.039$  and  $0.009$ ), respectively. Additionally, a significant association was observed between their responses to the two questions “Have you thought about the possibility of having oral cancer?” and “Do you consider yourself a depressed person?” ( $P=0.052$ ).

## Discussion

The present study aimed to investigate the prevalence and patterns of self-examination of the oral mucosa by patients referred to the specialized oral medicine department of Kerman Dental School. The findings revealed that the majority of the patients surveyed performed this type of self-examination in a similar manner.

**Table 2.** Frequency Distribution (Percentage) of Participants’ Answers to the First Part of the Questionnaire

Questions Item	Answers	Frequency (Percentage)
The Duration of The Oral Problem	One week or less	8 (4/8)
	One Week to One Month	25 (15/1)
	More Than a Month	132 (80)
How the Problem First Started	Caused By the Mark	147 (89)
	Oral Self-Assessment	12 (6/6)
	Accidental By Dentist	6 (3/6)
Personal Precipitation of Anxiety and High Stress	Yes	122 (73/9)
	No	43 (26/1)
Personal Precipitation of Depression	Yes	21 (12/7)
	No	144 (87/2)
Neurological Drugs Consumption	Yes	18 (11)
	No	147 (89)
History Of Cancer	Yes	7 (4/2)
	No	158 (95/7)
History Of Cancer in Relatives or Friends	Yes	21 (12/7)
	No	144 (87/2)
Total		165 (100)

de Barros Lima Martins et al reported that 22.4% of their participants aged 65 - 74 years performed mouth self-examination (MSE) for early screening of oral cancer.<sup>18</sup> Tarquinio et al, in the only study similar to the present study in terms of methodology, reported that 68.9% of respondents stated they performed MSE.<sup>17</sup> Although the rate of MSE in Tarquinio’s study was higher than in Martins’ study, it is still significantly lower compared to the rate in the present study. This difference could be attributed to higher levels of anxiety, depression, and stress in Iran.

In the present study, the majority of patients were women. In Martins’ study, men accounted for 47.8% of the total participants, and in Tarquinio’s study, men represented 52.8% of the sample.<sup>18,19</sup> Although there is a closer resemblance between Martins’ study and the present study in terms of the male-to-female ratio, both Martins’ and Tarquinio’s studies suggest a relatively equal presence of both genders.

According to the self-reports of the patients in the present study, most oral problems had started more than a month ago. Similar results were found in a study conducted by Chen et al, where the average time interval between the onset of oral symptoms and evaluation by a dental specialist was 13 months.<sup>19</sup> It can be hypothesized that as time passes from the onset of oral symptoms and the problem remains undiagnosed due to non-referral or other reasons, such as malpractices, the likelihood of performing MSE increases. However, in the findings of the present study, MSE was found to lead to the identification of oral problems in only 6.6% of cases.

In the present study, the majority of patients reported experiencing varying degrees of anxiety, which tended to intensify after discovering oral changes and undergoing MSE. In more than half of these individuals, concerns

**Table 3.** Frequency Distribution (Percentage) of Oral Self-examination Patterns in the Studied Subjects

Questions Item	Answers	Frequency (percentage)
Self-Examination Method	Looking in the Mirror	121(75/2)
	Looking in the Mirror and Touching	20 (12/4)
	Other Methods	20(12/4)
Discovery Of Changes Through Self-Examination	Yes	148(91/9)
	No	13(8/1)
Type Of Discovered Change*	Wound	47(31/7)
	Prominent Lesion	35 (23/6)
	Change In Color	27(18/2)
	Other Cases	39(26/5)
Self-Examination Frequency	Rarely	25(15/5)
	Daily Once	44(27/3)
	Several Times A Day	27(16/7)
	Several Times A Week	27(16/7)
Seeking Help from Others in Self-Examination	Yes	139(86/3)
	No	22(13/7)
Discovery Of Changes by Continuing The Self-Examination process	Yes	138(85/7)
	No	23 (14/3)
Creating Anxiety Due to The Discovery of Changes**	Yes	121 (87/6)
	No	17(12/4)
Thinking About the Possibility of Having Cancer	Yes	96 (59/6)
	No	65(40/4)
Level Of Stress Due to Thinking About Cancer	No Stress	1(1/05)
	Low	5(5/2)
	Average	18(18/75)
	High	24(25)
	Very High	48(50)

The total number of people for item \* is 148, \*\* is 138, and \*\*\* is 96, and for the rest of the items is 161. Because the three mentioned items are conditional.

about oral cancer were prevalent, and half of them experienced significant stress due to these thoughts. It should be noted that only 13% of the patients surveyed confirmed a definitive diagnosis of some malignant condition. Thus, the concerns expressed by a significant percentage of the mentioned individuals were unfounded.

Research has shown that a combination of anxiety and stress can lead to a disruption in the quality of life related to oral health.<sup>20</sup> Another issue to consider here is the possibility of somatoform disorders in patients who repeatedly self-refer to oral medicine specialists. Patients with various somatoform disorders initially tend to reduce their anxiety by converting it into specific symptoms. As a secondary objective, they may perceive that the expression of these symptoms can allow them to be absent from work they do not desire or are unable to perform, or that the

**Table 4.** Distribution of the Frequency (Percentage) of the Final Diagnosis Category of Oral Disease of the Participating Patients

Oral Disease	Frequency (percentage)
Pigmentation in Women	2 (1/3)
Exophytic lesion	24 (14/9)
Ulcer	36 (22/4)
Malignancy	21 (13)
Salivary Gland Diseases	4 (2/5)
White Lesions	67 (41/6)
Intraosseous Lesions	7 (4/3)

attention from their surroundings increases due to these symptoms.

In the present study, it was not possible to determine the relationship between performing MSE (in all patients surveyed) and the presence of somatoform disorder-related symptoms. However, Hassel et al have stated that a stable relationship exists between oral health-related quality of life and somatization (a common type of somatoform disorder), especially in older individuals. Therefore, for an accurate interpretation of the findings related to oral health-related quality of life, the symptoms related to somatization should also be evaluated.<sup>21</sup> Although Joury et al believe that the relationship between psychological disorders and oral diseases is complex due to the mutual influence of social, psychological, behavioral, and biological factors, it is difficult to thoroughly investigate this relationship.<sup>22</sup>

As mentioned earlier, the present study reported a high prevalence of cancerphobia among patients, despite only 3.8% of them having a previous history of any type of cancer, which contradicts the opinions of Ozakinci et al, who emphasized the fear of cancer recurrence in individuals with a history of oral or throat cancer. The high reported prevalence of cancerphobia in the present study may be attributed to social and cultural factors and the influence of certain mass media and the virtual space.<sup>23</sup> Additionally, the increased prevalence of anxiety, depression, and stress has a significant impact on the prevalence of cancerphobia. For example, a structured review has shown that the prevalence of major depressive disorder is 4.8% among Iranian women and 2.3% among men.<sup>24</sup>

Global studies have also demonstrated a higher prevalence of major depression in the Middle East and Africa compared to other countries, with women being more affected than men.<sup>25</sup> In the present study, the majority of self-examinations of the mouth were performed through mirror observation, and touch was used as an additional method alongside mirror observation. Due to the diverse anatomical landmarks of the oral mucosa, it is not possible to accurately identify oral mucosal lesions through mirror observation alone. It is often observed that

patients experience varying degrees of confusion, anxiety, or even distress after observing parts of their mouth in the mirror, such as different types of tongue papillae, leading them to visit a dentist with concerns about the presence of a disease.<sup>12</sup>

In a study by Mathew et al, among 247 patients who noticed a change in their mouth as a result of MSE and visited the respective clinician, a final diagnosis of a benign change or an anatomical landmark was made in 63% of cases.<sup>26</sup> In the present study, what patients identified as “lesions” were mostly interpreted as “ulcers”, while most of the identified lesions ultimately fell into the category of white mucosal lesions. This also confirms the high likelihood of patients misinterpreting what they observe or touch in their mouth.<sup>11, 27</sup>

The present study reports some self-examination patterns of the mouth for the first time, including the frequency of self-examination and seeking help from others during the self-examination process. Similar studies conducted by Tarquinio and Martins have shown a significant association between MSE and socio-economic factors such as education level and income.<sup>21, 22</sup> However, it is essential to note that in the present study, MSE was performed by all examined patients, and conducting examinations similar to those mentioned studies would require a control group of individuals who do not perform MSE.

One notable issue mentioned in the text is “geographic tongue” as part of mouth self-examination (MSE). The occurrence of this anomaly in individuals who have the habit of self-observing their tongues can lead to disproportionate levels of concern and stress. In some cases, patients with secondary burning mouth syndrome become aware of the presence of geographic tongue during self-examination. The higher the psychological condition of a patient with a geographic tongue, the more challenging this situation can be.<sup>10</sup> Another change that occurs on the posterior surface of the tongue and can be easily detected by patients is median rhomboid glossitis (MRG). This change has been reported by patients with secondary burning mouth syndrome (due to the association of this syndrome with psychological backgrounds). The main challenge for clinicians in dealing with patients who visit the clinic due to concerns about these changes is to assure them that these changes are not concerning or “cancerous”.<sup>15-17</sup>

After the COVID-19 pandemic and the difficulties in routine dental visits, some researchers have emphasized the importance of MSE.<sup>28</sup> However, based on the findings of the present study compared to what has been reported about MSE in sources other than oral cancer screening, it is difficult to make definitive conclusions about the benefits or harms of MSE performed by patients. For the first time in this study, the possibility of increased anxiety and distress in patients following MSE was addressed,

suggesting that further complementary research should be conducted in the future, considering the psychological profiles of individuals regarding MSE patterns in individuals with confirmed disorders such as depression or cancerphobia.

## Conclusion

The result of this study introduces intermittent and frequent MSE as a possible factor for the occurrence or exacerbation of anxiety and cancerphobia in patients for the first time, and its confirmation necessitates more studies.

In conclusion, the present study was conducted on a population of patients who all performed MSE to some extent. Most of them performed MSE through mirror observation, and the majority of respondents reported performing MSE several times a week. Most of them also sought help from others during MSE and became aware of changes in their mouth through MSE. These observed changes in the majority of cases caused varying degrees of anxiety, and significant numbers of respondents thought they might have oral cancer. There was a significant association between thinking about the possibility of oral cancer and individuals’ personal interpretations of being depressed or anxious. The results of this study indicate that the usefulness of performing MSE in all patients is questionable because repeated and excessive MSE in patients prone to psychological problems can have unfavorable consequences.

## Limitations

One limitation of the present study is that the high rate of self-examinations in the studied population may be attributed to the nature of the population (patients with oral mucosal problems), and conducting a similar study in a population without oral complaints may result in a lower prevalence of self-examination being reported.

## Acknowledgments

Authors would like to thank and appreciate everyone who contributed to this research.

## Authors’ Contribution

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## Competing Interests

The authors declare no conflict of interest.

**Data Availability Statement**

The data will be available from the corresponding author upon reasonable request.

**Ethical Approval**

The present study received ethical approval from the Research and Technology Deputy of Kerman University of Medical Sciences with the approval number IR.KMU.REC.1400.235.

**Funding**

Authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

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